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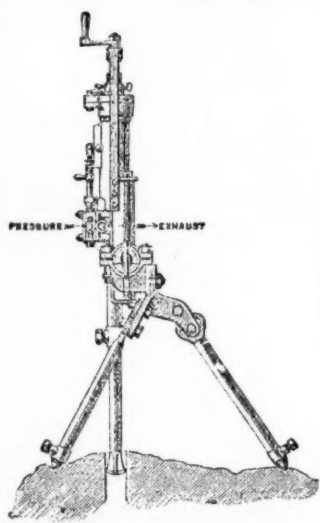
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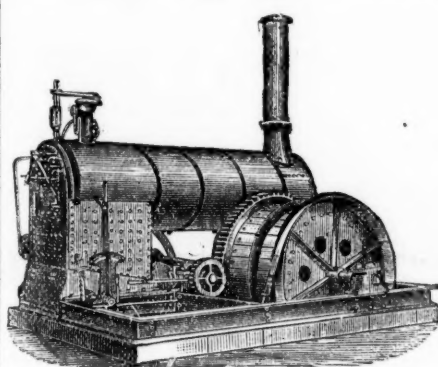
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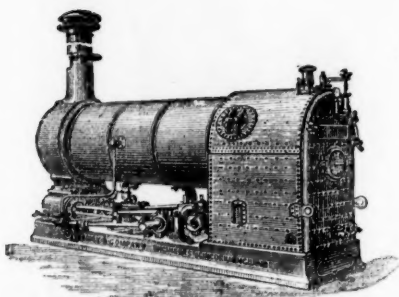
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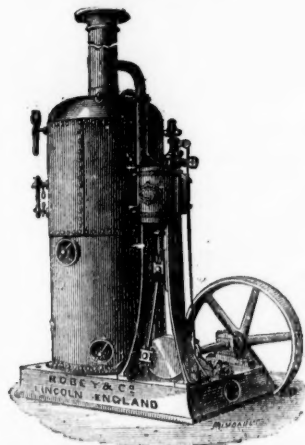
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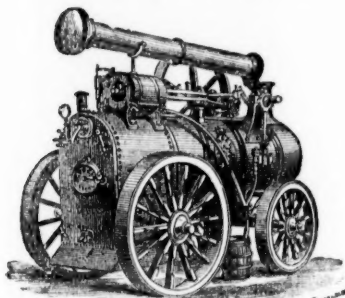
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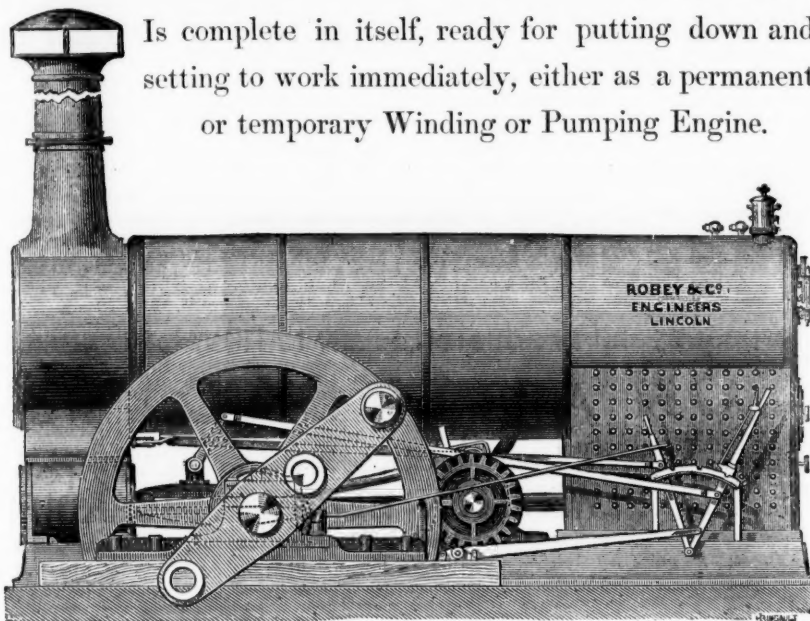
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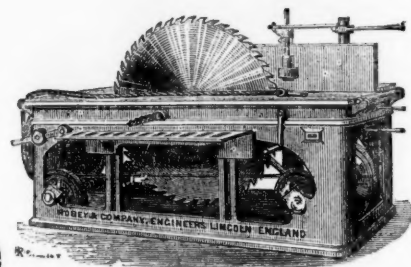
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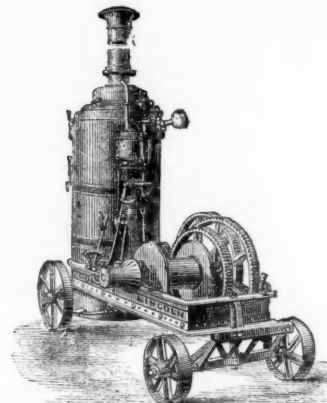
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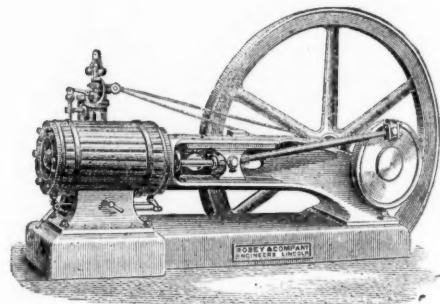
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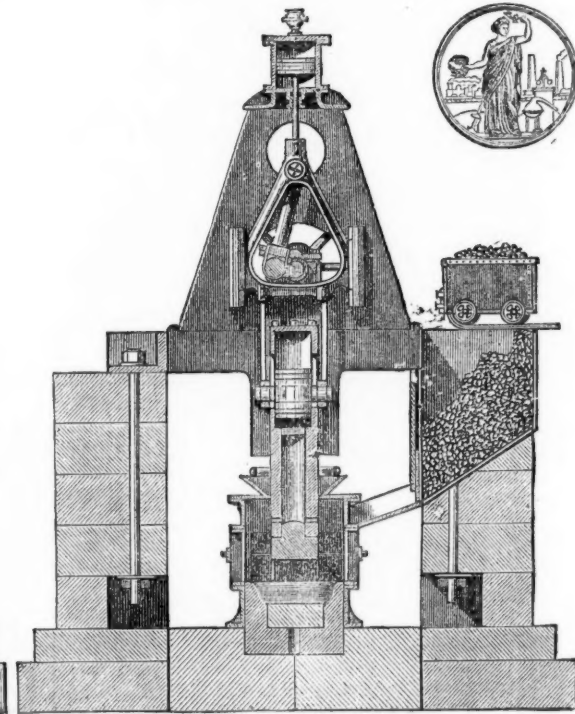
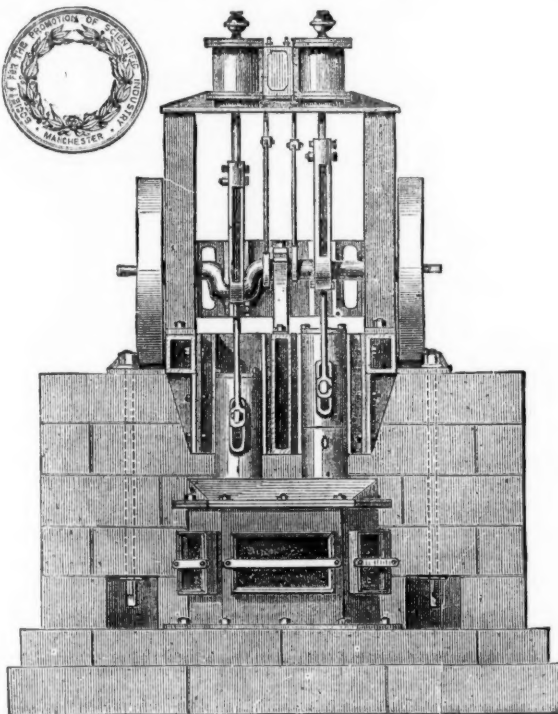
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Original Correspondence.

MINING IN IRELAND—No. X.

CONVERSATION BETWEEN A FATHER AND SON.

FATHER.—Having devoted our last conversation to the interests of copper mining, I propose that other minerals have a share in our attention this time—manganese, &c., to begin with.

SON.—Manganese ores I know are largely imported from Spain, and I believe there are some manganese mines in Devonshire, but I did not know there was manganese in Ireland till you made mention of it at our last conversation.

FATHER.—An earthy variety of manganese, called wad, occurs in many places in Ireland, but it is only Glandore and Roary Glen, on the south coast of Cork, and Houth, near Dublin, that claim our special attention. Glandore, which was so profitably worked for many years for manganese, produced two varieties—Pyrolusite (MnO_2) and Psilomelane (Mn_2O_3), associated with quartz and brown hematite iron. The lode is very large, and is observed throwing up boulders and nodules of ore for over three miles in length. At Glandore and Roary Glen only, however, has operations been carried on, leaving a far greater extent of country than has yet been exploited to the energy and enterprise of the future. It is also the oxides of manganese that occur near Dublin at Howth Head; it has also been found in small quantities in Wicklow.

SON.—What are the properties of manganese, and to what purposes is it applied?

FATHER.—Pure manganese is a brittle, reddish-white coloured metal, slightly magnetic, and sufficiently hard to scratch glass; it is employed to form an alloy with iron (spiegeleisen), which is used in the manufacture of steel. An alloy of manganese with copper and zinc produces a metal exactly resembling German silver. Sulphate and chloride of manganese are manufactured and employed in calico printing. The oxides of manganese are used for evolving chlorine. This gas possesses powerful bleaching properties, but for ordinary bleaching purposes the so-called chloride of lime is used. The chlorine employed for the production of this substance is generally manufactured by treating a mixture of manganese ore and common salt (chloride of sodium), with dilute sulphuric acid, or the chlorine may be produced by acting on the manganese ore with hydrochloric acid. In either case the disengaged chlorine is conducted into chambers containing shelves, which, together with the floors, are covered with slack lime to a depth of about 2 in.: here combination of the chlorine with the calcium and oxygen present in the lime takes place, and producing the bleaching powder. Manganese is also used in the manufacture of glass and for other purposes, which time will not permit me to describe in a conversation of this nature.

SON.—I am glad for this information, father, as I now understand why manganese ores containing the largest amount of oxygen are the most valuable, and why is it that assayers generally estimate the amount (MnO_2) contained in the ores.

FATHER.—Not having told you all the places in Ireland where lead ore has been met with, I will now speak of lead for a short time:—“The lower limestone of the east of Clare has been found to contain several very large deposits of galena, which have been worked by Mr. Taylor with great success. From his account of them, given to the Geological Society of Dublin, the following is extracted:—Milltown Lead Mines: The Milltown Lead Mines, in the barony of Tully, in the county of Clare, is probably one of the oldest mines in Ireland. At one time it may be supposed that there must have been a rich deposit, the ancient excavations being very extensive. The Royal Irish Mining Company took a lease of it about 12 years ago, but after partially clearing the old workings and driving a level for a short distance into the north side of the mine they abandoned the speculation, after raising above 11 tons of ore. In the year 1836 a grant of this mine was taken from the present proprietors, Anthony Colpoys and George O’Callaghan, by Mr. John Taylor, of London, whose name is so well known and deservedly identified with mining interest in England. The ancient workings were now completely cleared, and some rude tools discovered, such as oaken shovels and iron picks, the latter of an extraordinary size and weight, also the remains of fires which had been evidently made use of to crack and loosen the masses of calcareous spar and carbonate of lime, in which the ore of this mine is chiefly embedded. The spar is very beautiful, being perfectly white, and much of it transparent. After considerable labour and expense Mr. Taylor’s agent were disappointed in the expectations they had formed of making fresh discoveries of sufficient importance. The works, therefore, were abandoned in April, 1838, after raising 40 tons of ore, which upon an average yielded about 75 per cent. of lead and 37 ozs. of silver for each ton of ditto. Within half a mile of this mine, upon the estate of Mr. James Moloney, of Kiltannon, on the celebrated Tomines or immense natural vaulted passages of limestone through which the River Ardsallus winds a most extraordinary course, the place is extremely curious, and the stupendous masses of rock forming a gigantic roof over the river present a scene of magnificence which can never be forgotten by those who have viewed it. The same river loses itself again among the cavernous strata of limestone rocks near Quin, and afterwards passing through the picturesque lake of Dromoland falls into the Fergus below Castle Fergus.—Kilbricken Lead Mine, in the barony of Bunratty and parish of Dura: In the year 1833 attention was awakened by the circumstances of the accidental discovery of lead ore by persons in his employment on the estate of Mr. John M. Donnell, of New Hall, near Ennis. The first specimens were found by persons while cutting the new line of road between Meriesk and the new town of Clare, after which more important discoveries were made on the farm of Moniure by the tenant, John Egan, while cutting a drain through his bog. The specimens and description of soil and calcareous spar in which these stones of ore were discovered have been submitted to the inspection of Mr. Taylor, of London, he determined on sending agents to examine the district, and in consequence of their reports some experienced miners were dispatched from England, through whose exertions about 25 tons of lead ore were raised and shipped, which sold at a very high price, being found to assay for lead 76 per cent., and for silver 120 ozs. per ton. At this time, however, the rush of water from the surrounding bogs was found to be an insuperable obstacle to further progress without the aid of machinery, and it was then determined to stay the proceedings until a steam-engine of sufficient power to contend against the difficulty should be dispatched from England; this engine was erected and put to work in 1837. Operations are now going on upon an extensive scale, and great hopes are entertained of a successful result, but it is too soon to form an accurate opinion upon this point. This mine is situated within 2½ miles of Quin, and is about six miles from Ennis.—Ballyhickey Lead Mines, in the parish of Clooney and barony of Bunratty: This is the richest lead mine which has been discovered in the county of Clare, and is upon the estate of Mr. Hugh Singleton, of Hazlewood; in a direct line of distance it is about 1½ mile east from Kilbricken, and here lead ore was discovered nearly at the surface. Operations were commenced by Mr. Taylor’s agents in the autumn of 1834, and with decisive success, so much so that an export of 125 tons took place the following spring, and from that period to the present not less than 2500 tons have been shipped from the port of Clare to the River Dee, averaging by assay 77 per cent. for lead and 15 ozs. for silver in the ton of lead, and a considerable quantity of ore is still raised and shipped monthly. The three deposits of ore above mentioned occur in large veins of calcareous spar which traverse the limestone rock of this country; they differ from any hitherto observed in the mining districts of England and Wales, and, indeed, upon the Continent of Europe. The veins of spar are of immense width, in places from 20 to 30 ft., and they run generally a little to the north of east and south of west. The quantities of ore found at Milltown and Kilbricken are so small and the masses of spar so large that it is not easy to trace the intersection of veins or branches at the points of deposit as distinctly as at Ballyhickey. There the bunch of ore, the richest probably that was ever seen taking the number of tons raised and the number of solid fathoms of ground broken into account, occurs upon the intersection of two veins. The main vein runs N.E. and S.W., and its tributary falls in the angle of 45°. At this point the mass of ore was 16 to 20 ft. wide, in places almost pure, in others raised with

sulphuret of copper and zinc. The total length of the rich branch was about 40 ft., and it is still ore at the depth of 11 fms. How deep it may be worth pursuing is a question yet to be solved. The quantity of water is not considerable, although the mine is situated in the middle of a boggy piece of land. An engine, however, has been erected for the double purpose of grinding the ores and pumping the water. Fresh intersections of veins are still sought after, being the places at which only other deposits are expected.”

SON.—What is the usual gangue of the lead veins in Ireland, father?

FATHER.—Calc spar, quartz, and sulphate of baryta, also fluor spar in a few localities.

SON.—The sulphate of baryta must be of value if obtainable pure and in large quantities.

FATHER.—The sulphate of baryta (barytes) occurs very abundantly in many parts of Ireland. In Ulster it is found in veins in different parts of the Old Red Sandstone districts. The lead mines situated in the granitic ridge of Leinster have this mineral usually as a vein-stone, and it may be there obtained in large quantities. In Wexford several large lodes of it present themselves on the sea shore, and in the vicinity of Youghal it is found similarly circumstanced; also in West Cork two or three large veins are seen on the sea coast at Galley Head. The Cappagh Copper Ore Mines have this mineral in part as a gangue, and large quantities were obtained and exported from Dunmanus Bay from the so-called White Mines west of Dunbacon coastguard station.

SON.—Associated with copper ores it must be difficult to get rid of in washing.

FATHER.—Its specific gravity is about 4.5, while that of yellow copper ore is 4.3, so you may judge what a troublesome associate of copper it is.

SON.—You told me once, father, that the Government worked some gold mines in Ireland. I should like to hear more about the chances of obtaining the precious metals there.

FATHER.—The Government, shortly after the discovery of the occurrence of gold in Wicklow, took the business of its extraction into their own hands; it was found disseminated in the bed of the streams which descend from the northern flank of Crogan Kinshela, a mountain which lies on the boundary of Wicklow and Wexford, and at the junction of the granite ridge with the clay-slate. Quantities of gold were collected by the people, and one piece weighed 22 ozs. The gold was found accompanied by other metallic substances dispersed through the alluvium of the surface. The quantity of gold obtained by the Government operations was 945 ozs., which sold for 3675l., but the cost of the workings and some trials made in search of the original deposits of gold exceeded the returns, and the workings having been interrupted, were not again resumed. It has been calculated that 10,000l. was paid to the county people for gold collected before the Government took possession of the works. The gold is associated with magnetic iron ore, also iron pyrites, brown and red hematite, wolfram, manganese, tinstone in crystals, and quartz. From the nature of these accompanying minerals, of which most are known to occur in the quartz veins of the adjacent mountains, it was hoped that by tracing up the streams to their sources, and laying bare in various directions the underlying rock, the gold veins may be discovered, from the disintegration of which the sand and soil of the bed of the streams had been produced. All such trials proved unsuccessful, and the question as to the source from which the gold of those streams in Wicklow has been derived remains still unanswered. A large and powerful quartz and oxide of iron lode in West Cork has been found to contain small quantities of gold associated with pyrites.—*New Cross, London, March 9.*

MINING IN IRELAND.

SIR,—“The Conversation between Father and Son” which has lately appeared in your Journal upon this great mineral field of enterprise recalls to mind some early days of inspection I enjoyed with those two great minds and workers of mining industry, the late Mr. Henry English and Matthew Francis, in Waterford, Cork, and Kerry. There was no man struggled more to bring under the notice and confidence of its supporters mining in Ireland than the late Mr. Henry English; in fact, it may be said that he shortened his life for the cause, and to rid it of that great drawback to Irish enterprise—antipathy to nationality. It must be to many most gratifying to see some able practical man now come forward and chronicle this country that holds out such inducements and good prospects clearly and without prejudicial feelings, and more especially so at a time when it needs the kind hand of brotherly regard stretched forth to help her up with honest constant employment. Much is being done in charity by a benevolent public; but are we not degrading her with charity—are we not lowering her in the social position she holds to ourselves and the State by so doing? Let us support her industries if you will, but not charity and idleness. A true Irishman would prize more a few shillings he has worked for than a pound given to him in charity. There is no country occupying so small an area blessed with more resources for commercial enterprise than Ireland. Then why not support and encourage her in producing them by honest labour—assist in developing her mineral, agricultural, and manufacturing products. This will raise her to the status she should hold and would hold in regard to industry, commerce, and wealth.

Millions of British money have, and are at this moment, drifting from our shores for investments in Africa, California, India, and other foreign mining schemes where the investor can exercise but little if any control; and yet here, within a few hours’ ride of this great city of wealth is a country (we call our sister) teeming with hidden wealth standing alone and forsaken, awaiting our brotherly faith, friendship, and help. If thou had borne but another name than Ireland—if your mineral wealth could be transported to those distant regions which are now seeking for the gold from out of your brother’s pockets—Oh, how you would be extolled! Oh, what a mighty roush would be made to your shores; but, alas! thou art forgotten—thou art “Irish,” and yet again but for a little of thy brother’s help now being transported to foreign soil it would bring warmth to your hearths and comfort to many a cheerless heart.

In following your correspondent (Father and Son) upon Ireland (Nos. VIII. and IX. of his notes and remarks), in calling attention to that great mineral county Cork, he clearly points to a great field of enterprise and employment of capital, stretching some 30 miles and upwards in length, and half the distance in width. West Carberry, bounded on one side by Dunmanus Bay, on the other by Cape Clear (St. George’s Channel), he truly names districts and places where good evidence exists of great mineral strength; and yet they stand quiet in their greatness, as if the pestilence and famine of 1848 still existed, and had driven away its inhabitants never more to return. Here, truly, we find the good old mines and lodes of Ballycumisk, Cappagh, Cooshen, Ballydehob, and many others to the east and south-east, and Dhurode, Bonlysallagh, Spanish Cove, and the Crookhaven district on the north and west that call for special attention, and the application of capital. Here we have considerable prospect work done sufficient to convince any practical mining engineer that he has something great awaiting him and to work for. Let us not lose time, then, in controversy about geologists having plied their brushes too much in their colouring red or blue. We have all committed errors (none of us are infallible), and none more so than those who are continually raking up old errors without seeing their own. I can say in all mining districts there are plenty such mistakes to be found, and none more so than in the old country I belong to (Wales), and also any amount in Cornwall, the latter of which would outnumber the whole of Ireland. Therefore, as this will not avail anything, let us not condemn the country or stigmatise its nationality. Let all honest miners ply their talents and energies to do their best in correcting the past, and no longer to croak about “I am right, you are wrong; the mine I am interested in is that which is sound—yours are all rot.” This conduct, together with the exactions of estates’ agents in Ireland has done much injury and deterred investors coming forward. With a good feeling of honest intention and enterprise to do our best as experts we may see before many months the whole district from these great works at Ballycumisk and the great promising caunter lodes at Dhurode (so ably referred to by your correspondent upon Ireland) again in full activity and work, giving employment to hundreds, and bread to thousands of its people, who are now wanting. May such be the

event before long, and may they meet with that success they deserve in developing the prospects of mineral strength that these districts abound in.—*Camdenwell, March 17.* C. E.

WINDING ENGINES.

SIR,—The earliest application of the steam-engine for raising coal was probably as a pumping-engine to raise water from pits for the supply of water-wheels, the water-wheel with a drum attached being the medium for raising coal. In later times the water balance has been used to some extent in the coal pits of South Wales for raising the mineral, a water tank under the cage being filled with water before each draw until it overbalanced the weight of coal to be raised on the opposite side of the chain. This method of raising coal might be tolerated where a limited quantity was required, and where there was a liberal supply of water and free drainage from the bottom of the pit, but in some cases the water had to be raised again by a Cornish pumping engine; this was done when the bottom of the pit was more or less below the natural drainage of the surface.

The beam winding-engine was a form much in use in the beginning of this century, and may be seen at work still in some of the shallow pits of the northern coal field. This engine was usually worked on the second motion. Its disadvantages consist in the cumbersome beam and the low position of the drum with regard to the pit pulleys, giving an acute angle and less duration to the ropes.

The direct-acting lever winding-engine with vertical cylinder has been generally adopted at the principal collieries of the North until recently. One lever or beam is fixed to the front of the engine-house, the other to the back of it at a different elevation. The piston-rod is connected by straps to the inner ends of the levers, which give a vertical motion to the piston-rod. Engines of this type have been made with a cylinder as large as 68 in. diameter by 7 ft. stroke. The advantage with one cylinder is that there is the full power of the large cylinder available to make the lift from the bottom of the pit. The drum being placed at a considerable elevation is favourable to the duration of ropes. The engine-house in many cases is raised as high as 70 ft. above the surface, and the drum centre is nearly at the same elevation. This arrangement makes the rubbing and wear on the inside of the cylinder to be nearly uniform all round, and affords the advantages of tight fitting pistons and much longer duration to the cylinder.

An engine of this type, with 40-inch cylinder by 7-feet stroke, steam pressure 45 lbs., non-condensing, has raised about 1000 tons of coal in 11 hours’ work per day from the depth of 155 fms. with double-deck four-tub cages. Instead of the front lever a strong beam is fixed on the front wall, which serves the same purpose as a lever, and also for pumping purposes at the out end. A connecting rod from the out end of this beam to a pumping beam below serves to work a lower beam (which extends to the pit) and the pump rods attached to it. This was designed for pumping water from the pit at night time, but is discontinued, other arrangements having been made for raising water by an independent pumping-engine. At the same colliery another winding-engine is erected of a form often seen in the Lancashire coal field. There are two vertical cylinders, 36-inch diameter by 5-feet stroke, non-condensing. The piston-rods are kept in a vertical position by means of blocks sliding in guides, a similar method being adopted for the single cylinder vertical engines, formerly so much used in Lancashire. The engine above referred to is intended to raise 1000 tons of coal per day from the depth of 105 fms., cages of two decks and carrying four tubs being used. Neither of these engines are counterbalanced. The ropes are of iron wire, and round; the drums are cylindrical.

Of late years the transition from vertical engines with one or two cylinders each to horizontal engines has become almost universal; the latter, as a rule, have two cylinders each. There are now fine examples of the double cylinder direct-acting horizontal engines at the deep shafts of every colliery district in England and Wales, the more powerful engines being fitted with double-beat Cornish steam valves, steam brake, and drums either plain, conical, or the modern spiral form. The small engines are fitted with slide valves, foot brake, and plain drum. The low position of the drum is a disadvantage appertaining to the horizontal engine; the wearing of the lower part of the cylinder from the action of a heavy piston working on it is another, which is not altogether obviated by a back piston-rod and slide block connected to it. The latter disadvantage will become more apparent as the engine cylinders become worn from long use, and will necessitate a frequent re-boring or renewal of them.

In deep pits, where heavy ropes are required, it is of great importance to have a winding-engine well counterbalanced. In lifting the load from the bottom of the pit (say 300 fathoms in depth) the engine has not only to raise the weight of coal in the cage, which may be (say) 2½ tons, but also the length of rope from the bottom to the top of the pit; this at 14 lbs. per yard would weigh 3½ tons, and the gross weight to lift would be 6½ tons. The cages balance each other, so that these need not be taken into account. To assist the engine in lifting this great weight from the bottom two modes of effecting the purpose are most commonly adopted, the more modern and less expensive method being by means of the spiral drum; the older method operates by one or two counterbalance chains at the back of the house winding on small drums or rolls fixed on the main shaft. The conical or slightly sloping drum is practically of little service to the engine in starting when round ropes are used; the same may be said of the roll for flat ropes; with the latter the increase in diameter at each turn is twice the thickness of the rope, or about 1½ inch, which is quite inadequate to counterbalance the weight of rope in lifting from a moderately deep pit. When the cages are at meeting the two ropes are nearly on a balance, and as the full cage ascends above that point the counterbalance operates in acting against the engine in an increasing ratio until it arrives at the top.

An extensive colliery in Durham has two non-condensing winding-engines, fitted with spiral drums. The first was erected in 1870, and has been in operation since that time, winding a large quantity of coal daily. The engine has two 42-in. horizontal cylinders, by 7-ft. stroke, fitted with four double-beat Cornish valves. The eccentrics work on a counter shaft; this arrangement allows the shortening of the main shaft. The spiral drum is flat in the middle part; in the groove in the centre the steam-brake acts, and about 2 ft. on each side is flat, on which the last two or three turns of the rope in raising the load lap. The diameter of the drum at this part, where the spiral groove commences, is 26 feet, and it gradually decreases to 16 ft. diameter. When the empty cage reaches the bottom the rope attached to it is suspended from this, the smallest size of the drum, and when the same cage is loaded again the engine is in the position to lift the load with the smaller lever, while the empty cage is suspended from the larger lever, and thus a counterbalance is obtained. Though the two ropes may not be on a balance throughout this system is still a great advance on the drum and sloping sides or the rope-roll. For a deep pit it is essential to have a greater divergence in the diameters of the spiral portion of the drum to give the best results in equalising the load throughout.

The second engine, which has just been completed, has two 48-inch horizontal cylinders, 7-ft. stroke, double-beat valves and steam-brake. It acts direct to the spiral drum, which is 30 ft. at its largest diameter and 20 ft. at its smallest. The arms of the drum are of cast-iron, the perimeter, or shell, is of cast-steel, to which the spiral grooves, also steel, are rivetted.

The only other mode of counterbalancing winding-engines which is adopted to any extent is by means of the counterbalance chain. It consists of a very strong linked chain, to which a bunch of six or more cable chains of considerable length is attached; these are raised and lowered in a short pit or staple at the back of the engine-house at each wind. This is connected to the flat chain winding and unwinding on a small drum fixed on the main shaft. When the engine is in a position to raise the load from the bottom the whole of the chain is suspended in the staple, its weight acting in assistance to the engine, the chain is gradually falling on the bottom of the staple whilst the load is being raised up to meetings, when the chain on the small drum has run out and reversed a check is given to the engine, the chain is then gradually raised and acts in retarding the engine and in balancing the extra weight of the rope attached to the descending cage. When the latter reaches the bottom of the pit the

whole of the bunch and the chain has been raised, and is again suspended from the drum ready to start the engine in the next wind.

The chain counterbalance at Silksworth Colliery may be mentioned as an example of its kind. Two chains are used, each rising and falling in a staple 24 fms. in depth, the weight of the chain being 14 tons. The winding-engine at this colliery has two 48-in. horizontal cylinders 6 ft. stroke. It is direct-acting and non-condensing; the initial steam pressure is 45 lbs. It acts expansively, being cut off at one-third of stroke. The drum is cylindrical, 25 ft. in diameter. The ropes are of steel, weighing 14 lbs. per yard. Depth of pit 600 yards; winding in 45 sec. in 22½ revolutions. The weight of one cage with chains is 6160 lbs., of one rope 8169 lbs.; of eight empty tubs 2 tons; of eight full tubs 4 tons. The counterbalance roll on the drum-shaft is 2 ft. diameter at the middle of winding, and 7 ft. diameter at the termination of the wind. By this arrangement of the chains it will be seen their weight greatly exceeds the weight of the load and rope at the termination of the winding, but the load in the pit and the counterbalance are suspended from levers of different length. This excess of weight acts in bringing the engine more quickly to rest, and also assists materially the starting of it at the succeeding winding. The weight of the rope in pit 3½ tons by 25 ft. = 93.75; the weight of counterbalance chains 14 tons by 7 ft. = 98 tons, the respective forces acting on the engine.

M. E.

PUMPING ENGINES.

SIR, I should have given an answer to the enquiry of "D. B." in last week's Journal with pleasure had I been in possession of any tests of the compound differential engine. I have frequently watched the performance of the pumping-engine at South Durham Colliery on Mr. Davey's principle erected at the top of the pit. The steady and gliding motion of the piston-rod is quite a treat to witness; between its motion and the violent movement observable in the working of Cornish engines there is a marked contrast. It may be observed here that the differential gear has been applied to many Cornish engines in this country and on the Continent, and with marked success. The gear can be fixed to those engines within the space of 24 hours. The result always has been that violent shocks to the engine and pit-work are avoided, and less wear and tear in every way. The duty of the East Hutton engine is stated to be over 90,000,000 foot pounds per cwt. of coal consumed on the assumption that 1 lb. of coal evaporates 9 lbs. of water.

M. E.

COAL GAS EXPLOSIONS.

SIR, Respecting the recent explosion of gas on board the Columbine, in Penarth Roads, I beg to call your attention to the plan I have submitted to the Board of Trade, to the effect that if there was one hollow beam and stanchions perforated with holes at the after end of each hold, and a strong deck-pipe connected to the beam, a pump, automatic in its action, could be connected at any time to draw the gas away, and prevent these explosions.

The hold would then be kept dry in heavy weather, the hatches could be battened down, and the vessel made safe.

I feel certain, had the Board of Trade adopted my plan, not only would the explosion that occurred on board the Columbine have been prevented, but many others that I could name, and I am sorry to say with loss of life.

I am also of opinion that, when a vessel is at anchor, and a strong wind blowing, it will drive the gas to the after-part of each hold, or in case the vessel was under steam the gas would be the same in each hold, so when the pump was at work it would draw the gas and prevent explosion.

The Board of Trade should introduce other means than the present ventilators before they condemn masters of vessels for negligence, when all they recommend is surface ventilation, and the captain has hatches off at the time of the explosion, which I know was the fact in two cases. One captain was killed in his cabin, and another would have been, only he had just left his cabin before the explosion.

Tubal Ctin Ironworks, Cardiff, March 12. JOHN HARRISON.

WEST OF ENGLAND GUNPOWDER COMPANY.

SIR, I did not notice the Kennall Gunpowder Company's letter in the Journal of March 6, or I should have replied to it in your last week's issue. They are quite right in stating that it is nearly twelve years since I was the managing partner of the company, and that my interest was a small one only; but they omitted to inform your numerous readers that I was clerk, traveller, and cashier to the firm from January, 1811, to December, 1863, and on the death of my father, Mr. Richard Lanyon, of Kennall Vale and Acton Castle, became managing partner with the old Mr. Sampson's nephew, who, with my father, was founder of the works. My partner, the second Mr. Sampson, died in March, 1864, leaving his entire freeholds to his steward and solicitor, the late Mr. William Shilson, of St. Austell. Subsequently Mr. Shilson became possessor of nine-tenths of the gunpowder works, and died in March, 1875, sole proprietor. Mr. Shilson was a gentleman widely known in Cornwall, and was interred in the family vault at Mabin. The vast assemblage at his funeral, although a private one, will testify to the respect he was held in by "One and All."

W. H. LANYON,

Manager, West of England Gunpowder Company.

St. Michael's House, Cornhill, March 18.

ROCK DRILLS.

SIR, We notice a letter in last week's Journal from Mr. Schram in answer to one in your columns of the 6th inst., signed Roger D. Jones, upon the trial between Mr. Schram's drill and our Eclipse. We do not intend commenting on the trial more than to say we knew nothing of anything of the sort having taken place until we received the enclosed report, some days afterwards, from Messrs. S. Lake and Co., to whom we sold the 2½ in. drill at the end of last year, and that Mr. Schram is in error with regard to the size of the bits and the hardness of the rock. The bits used with our drill were 1½ in. and not 1¼ in. as stated by Mr. Schram; in regard to the rock, it is a very tough stone, and the contractors are far too shrewd to go to the expense of rock drills if they could get it out with a pick. We shall at any time be very pleased to afford Mr. Schram an opportunity of running his drill against ours either in hard or soft rock, at the Milford Haven Docks or in Cornwall. We must, in fairness, ask you to publish the enclosed report from the sub-contractor to Messrs. S. Lake and Co.—London, March 17.

HATHORN AND CO.

GENTLEMEN,—As requested, I beg to hand you a report of Schram's drill v. the Eclipse. I put the two drills side by side in the dock bottom, both taking their steam from the same boiler, and both using same size hose. On Thursday, the 12th inst., owing to Schram's drill getting out of order—something slightly the matter with the valves—I did not consider it a fair trial, and consequently tried them again to-day. The result of trial is as follows: The drills were worked 3½ hours, including stoppages, owing to Schram's drill getting out of order, when I immediately had both stopped, so that both drills should work precisely the same time. The Eclipse boring 19 ft. 5 in. and Schram's 9 ft. 11 in., which is equal to—Schram's 34 in. per hour, Eclipse 66½ in. per hour. This proves to my satisfaction the superiority of the Eclipse over Schram's, both in point of speed, steadiness, and easy working. I may mention my own man worked the Eclipse, and a man sent with Schram's worked theirs.

Messrs. S. Lake and Co.

A. R. STEPHENS, Sub-contractor.

FLAGSTAFF SILVER MINE.

SIR, In last week's Journal there appeared a letter with regard to the above company written by a party who styles himself by the very knowing like sobriquet of an "Eye Opener," perhaps with the idea of leading the public to understand that he knew something of what was going on behind the scenes, and could, as it were, tell a thing or two. No doubt the letter appears as if it emanated from a very enlightened individual indeed, and is written in such a manner as is calculated to alarm weak holders, but it is to be hoped they will not be taken in by the logic of anyone who may have a reason for getting the market price of their stock depressed as much as possible. Everyone knows it is a much easier thing to speak ill of a concern than to speak well of it, and the effect produced by the former is much greater than that produced by the latter. But with reference to the mine itself, I am in a position to be able to state that the sum agreed upon to be deposited for the purchase of the mine has been subscribed by a wealthy and influential syndicate, and the character of these gentlemen is such that they would not

lend themselves to the reconstruction of anything but what they believed to be a *bona fide* concern. The mine has been known to pay large dividends. The shares have been quoted at from 7l. to 7l. 10s. premium, and it is well known there is plenty of silver in it. Moreover, I understand it is in working order, and one-half the sum mentioned by your correspondent would be more than sufficient to form a working capital. What the mine has done before I have no doubt it can do again, and under the new auspices and improved methods of working I believe it will be much more successful, and, therefore, I would say that every holder should not only stick to his stock but even increase it.—March 17.

BOTH EYES OPEN.

FLAGSTAFF SILVER MINING COMPANY.

SIR,—In last week's Journal a letter dated March 2 from "One who Knows" confidently predicted that the shares in this company would reach 10l. per share in a few days in consequence of the action of some syndicate, which now turns out to be a subscription list amounting to about 8000l. (no portion of which has been paid) for the purpose of purchasing the mine if approved of by an agent to be sent out. The knowledge of this correspondent must have been very limited, seeing that the syndicate was not even negotiated with the representative of the owners. Had they done so the real price asked for the mine would have been made known, and the shareholders duly informed, so as to give them a proper opportunity of judging of the value of their shares.

If a new company is formed for the purchase of the mine the shareholders and debenture-holders in the Flagstaff Company will probably be given an opportunity of subscribing for 30,000 shares, being share for share, the new shares being of 1l. each, and to be allotted as fully paid-up shares upon payment of 5s. per share. This would give a present value to the Flagstaff Company's shares of 15s. per share to be credited to them on their shares in the new companies, and in course of time the new company's shares will probably command a good premium.

As to the "generous consideration" which is promised in the circular sent out by the secretary, the term is so vague that it is impossible to estimate what value it can attach to shares and debentures in the Flagstaff Company. The 10l. shares of the company were quoted at 4l. per share when this circular was issued, making for all the shares 120,000l.; the debentures to 25,000l.; and interest together (say), 145,000l. This certainly is a large amount of generous consideration to tack on to a mine which the owners are willing to sell for 40,000l., and which needs, perhaps, 20,000l. more spent upon it to bring it into a profitable condition. Yet, if the secretary's circular means anything, it must mean that the syndicate, in promising "generous consideration," must have intended to give the shareholders at least the nominal market value of their shares for the time being; but I am afraid the shareholders would have been very much disappointed in the result had the syndicate and the gentleman with whom they were dealing been able to bring about an arrangement which they have been working hard at for the past four months. If the new negotiation being at present carried on by the duly authorised agents of the owners is successful the share and debenture holders may reckon upon receiving a 1l. share in a new company for each share now held by them upon payment of 5s. per share, the proceeds of which would be applied towards working capital.

—ONE WHO KNOWS BETTER.

THE CANADIAN COPPER AND SULPHUR COMPANY.

SIR,—Your correspondent "J. M. F." is not very happy in his illustrations if he writes to depreciate the value of Canadian Copper shares. Devon Consols was once the richest copper mine in Cornwall. Its history was this: It ruined several sets of adventurers; was finally sold for 1000l.—only one-tenth of the lowest value of Canadian Copper; afterwards paid over 1,000,000l. sterling of dividends; and for many years, while it was a rich mine, was worth in the market over 1,200,000l. sterling. Panulicillo I have referred to in my Circular, printed in your columns, as another instance of revival. "J. M. F." leaves out of his valuation the considerable debenture debt of that company. If I am correctly informed there are two of the Canadian Copper properties—Hartford and Acton—each worth a Panulicillo, besides a dozen others as promising but yet undeveloped.

"J. M. F." ought to have mentioned, in fairness, another mining property well known in Glasgow—the Tharsis, which for a long series of years was valueless to its French owners, but is now worth 4,000,000l., and has been worth over 5,000,000l. sterling. If "J. M. F." will have a little patience he will learn why Canadian Copper shares are not merely worth 3l. per share, but even more than the 2l. premium "at which its sanguine promoters brought it out." I would advise your anonymous correspondent to lay to heart the admonition of Hamlet—

"There are more things in heaven and earth, Horatio, Than are dreamt of in your philosophy."

10, Tokenhouse-yard, March 15. WILLIAM ABBOTT.

MEXICAN BONDS—OLD ISSUE.

SIR,—The letter you did me the honour to insist respecting the Mexican Bonds of the old issue of 1851, now quoted at about 13½l. for the 100l. bonds and 17 or 18 overdue coupons, appears to be confirmed by the Daily News of this day. Probably in April, after the Mexican Congress have met, that Government may see how desirable it will be to retrieve their credit by satisfying the claims of the bondholders, more especially as the Mexican Government appear to have long ago, from time to time, paid off a considerable portion of the loan. Taking the 100l. bonds and overdue coupons as altogether worth, nominally, 140l., surely the bondholders, even if they compromised their claims, ought to receive at least half their value—say, 70l. per bond. However, I suppose the question will be settled by the end of April.—March 17.

LOOKER-ON.

KAPANGA GOLD MINE.

SIR,—As the capital has been found for this company I hope the operations at the mine will now be carried on vigorously, and not in the spiritless manner that has obtained there of late. Had the undertaking been prosecuted with energy success would have been attained long ago, nor would it be surprising in a mine yielding at some of the points gold worth 20l. to the ton of quartz. It is hoped the good results anticipated by many of the shareholders on account of Mr. P. Watson's accession to the directorate will soon be achieved.

March 16.

A SHAREHOLDER.

CORNISH MINING—THE GWENNAP DISTRICT, AND ITS UNWROUGHT GROUND.

SIR,—Since the introduction of this subject evidence of productive veins in unexplored ground is frequently occurring. The valuable discovery of both copper and tin at Wheal Comfort, which I have long since advocated the working of, has been a stimulus to the prosecution of other ground in this district, requiring only a small outlay to open up mines of great value. The ground on the south, west, and north slopes of Carn Marth granite range abound with mineral veins, and it is not a little surprising that such tracts of unwrought ground remain idle for want of enterprise, especially seeing that they embrace the richest lodes ever discovered in Cornwall. It must be borne in mind that the greatest discoveries of mineral have been made with an outlay of a small amount—as, for instance, Tresavean, on the south flank of this granite upheave, divided 60,000l. in one year, on an outlay of only 1000l., and the shares were marketable at 2000l. each. Parallel to this is a new mine, called East Wheal Buller, adjoining to Wheal Buller and Wheal Beauchamp on the east, embracing the same lodes. About 25 years since Wheal Buller was selling at a market value of 250,000l., and on an outlay of only 4000l. To the east of this new mine the same lodes pass into the Great Consols United and Clifford Mines, the returns from which have amounted to a fabulous figure, and yet this unexplored Wheal Buller remains in whole for a length of over half a mile on the course of the lodes. It is, moreover, an important fact that it is precisely the same granite formation as the adjoining ones that figured within the present century amongst the greatest and richest mines in Cornwall; it is also

important that its lodes carry a gossan back equal to any lode in Cornwall, being altogether of such a character as cannot fail having regularly continuous courses of copper ore under it. This is a firmly established rule, there not being an instance of such a "gossan back" lode proving a failure.

The resuscitation of West Poldice under the auspices of Captain Teague, of Carn Brea and Tincroft, is causing more attention to be drawn to the district, it being well known that its temporary suspension was caused by the stoppage of an adjoining mine, whose water overflowed into and overpowered its small inadequate steam-engine, leaving tin and copper broken underground (which was overflowed by water before it could be drawn to surface) worth nearly 1000l. This adjoining mine, with its 70-in. and 24-in. cylinder steam-engine, has now been purchased and paid for, for the small sum of 1550l., and by the end of July will again be in good working order. As recently as four years since this mine (without the valuable adjunct now added to it) was selling at a market value of 40,000l., with tin 20l. per ton less than now. There are other properties which I trust on another occasion to refer to, believing the time is not far distant when discoveries will be made which will revive the remembrance of the brilliant era of Gwennap copper mining of former days.

St. Day, Scourier, Cornwall, March 18.

CHAS. BAWDEN.

LEAD MINING IN WENSLEYDALE.

SIR,—The dressing of lead ores in the above district is, on the whole, not very difficult. The gangue being limestone, crystallised calcium, carbonates, fluor-spar, and sometimes heavy spar, the specific gravity of the three former being light affords an easy separation, while the latter, although its density equals, or even exceeds, that of black jack, owing to its distinctive colour, a visual separation is rendered easy. Zinc sulphuret is present with the ores, but is not deemed of commercial value, and offers the most troublesome resistance in both dressing and smelting. The minerals as brought from the mines are tipped into cells, where a hand selection of the most conspicuous portions is made. If dirty and intermixed with clay it is washed over a grate and hand selected, particularly if containing rich solid ore, but when there is an abundance of clay and clogging substances in the vein matrix it is sent direct to the crusher. Being granulated the mixed mineral is passed on to the jigging apparatus, where at the first washing the greater portion of the gangue is thrown off. The "chats" or vein matrix which still require further granulation are selected for re-grinding, and any clean ore that may be present in the sieves beyond what is wanted as bedding is taken, but a large portion of the lead ore, intermixed with sand, passes through the sieve into the tubs. This "smithem," as it is called, is trunked by washing out the fine sand and slimy portions. The half dressed mineral is again jigged, after which a slight washing in a stream of clean water, to remove any mud that may have been precipitated in the tubs, leaves the ore ready for the smelters. The sand and slimes containing the fine particles of ore are passed through the ordinary round buddle once or more times, depending on their richness. The heads or richer portions are further manipulated by being worked through the dolly, which, like the loobing of tin ores, are put into a kieve containing a portion of clean water; the whole by being violently agitated is kept suspended till the dolly-tub becomes full. Owing to the greater specific gravity of the ore it more readily precipitates to the bottom, and the waste by being skimmed off leaves the former ready as a second-class ore for the smelt-mill.

As is frequent in the Northern lead districts, the Scotch hearth is used in preference to the reverberatory or other furnace for lead smelting. Its advantages are economy of fuel, its adaptability to intermittent work—where the services of only two smelters are required but slight loss is incurred by having to light up each morning—its comparative freedom from want of repairs, its utility in using as fuel the peats dug out of the bogs on the adjoining moors, also by permitting the ores to be used in their green state—i.e., without having been previously roasted. Another important advantage in this district is the plentiful water supply, as motive power, to generate the blast. At the Keld Heads Smelting Works the blast is generated in a pair of cylinders driven by a 22-ft. water-wheel, supplying about 600 cubic feet of air per minute—a sufficient blast to permit three hearths to be working simultaneously. In the Scotch hearth used in this district the hearth box is of cast-iron usually 1 ft. deep below the workstone, the blast being admitted through a nozzle at the lower part of the back of the hearth box, a spark bar being placed across the middle of such hearth box. The hood is of brickwork, terminating in the flue. The internal arrangement of the hearth, or those parts exposed to the fire, is made up of rectangular blocks of cast-iron, though in working parlance going by the name of backstone, pipestone, workstone, &c. There is a small pot in front of the workstone, into which the melted lead is collected by running from the hearth down the groove in the workstone, the lead being kept in its molten state by a small fire beneath the pot, and at proper intervals it is ladled out into moulds, forming pig-lead. When smelting, two men work together at each hearth, requiring further the service of a lad to wait on them, but little time is required to get to work. The hearth is filled with peats up to the height of the spark bar. Immediately the peats are on fire the blast is turned on. The browse, or that portion of partially smelted ore and cinder drawn from the fire when leaving off on the previous day, is again put on, and a light charge of ore added. In about 20 minutes the lead is running down the workstone into the pot. Before, however, the most useful effect is attained the lead in the hearth box, and which is about 1 ft. thick, must be thawed, thus leaving the fire to "swim" in the hearth box on the molten metal. Immediately the flames have burst through the superposed charge of ore, thereby oxidising the lead, the fire is broken up by poking, and drawn on to the workstone. A peat, in size about 15 cubic inches, is placed before the blast hole, a sprinkling of coals if required is thrown in, and the drawn, partially smelted ores again thrown back over the spark bar, adding on the top a fresh charge of ore—a charge being from 40 to 50 lbs. This operation is repeated at intervals of from four to six minutes, the lead running freely into the pot. The frequent drawing of the browse on to the workstone, thereby exposing the half smelted ores to the cooling influence of the atmosphere, seem to exert a beneficial influence, for on again working it back into the hearth the lead runs much more freely. Much, however, is due to displacements of liquid metal in hearth box owing to temporary increased weight of the fire.

The produce of the ore will obviously depend on its richness, and the skill employed in manipulating it. The smelting in the Scotch hearth is usually done by contract, the smelters being paid only for the lead thrown out ready for market. To smelt 32 cwt. of ore is deemed the shifts' work for two men, and if the result is 22 cwt. (pigs) of clean lead, the produce is considered fair, and by reducing we have 68.75 per cent., a yield which still leaves a large portion to have been oxidised and carried away as fumes. For, from data obtained during the past 2½ years, after collecting and re-smelting the condensed fumes, resulting from the smelting of the three classes or crop, second-class, and slime ores in Scotch hearth, slag hearth, and reverberatory furnace, the produce of pig-lead to the total quantity of ore smelted was slightly over 76 per cent. The fumes produced 11 per cent. of the pig-lead, evidence rather conclusive as to the economy of condensing appliances, though it should be said relative to the above that the Stockoe condenser, as well as a flue nearly two miles long, are in force.

Without going into detail relative to the total cost, but rather taking an ordinary shifts' work of two men, and in which no especial effort was made to minimise the fuel used, or to get an increased produce, the result was as follows:—Fuel used to heat the pot and to smelt 32 cwt. of ore; coal, 1 cwt. 3 qrs.; peats, 2 qrs. 14 lbs., producing 22 cwt. (pigs) of clean lead. Grey slag produced 2 cwt. 1 qr. 21 lbs. Since the blast is generated by water-power its cost need not be considered, nor anything beyond the above for actual work. Then, the cost for smelting 32 cwt. of lead ores, producing 1 ton 2 cwt. of lead, at 9s. 6d. per ton, 10s. 5½d.; 1 cwt. 3 qrs. of coal, at 6½d. per cwt., 11½d.; peats, 1s. 7½d.; helper, by day, 1s. 6d.=14s. 6½d., or, as per above, 13s. 3d. per ton of lead smelted. But the following is, perhaps, as good a result as often attends the smelting of lead ores in the Scotch hearth. Summarising a week's smelting at Keld Heads Mining and Smelting Company's Works, wrought by the leading

smelter, W. Stanger, and under the supervision of Mr. W. Weston, of which elaborate mention is made in Dr. Percy's Metallurgy of Lead, the average per day by smelting 32 cwt. of lead ore was 1 ton 3 cwt. 3 qrs. 7½ lbs. of clean lead—a produce of lead direct from the ore of 74.44 per cent., and at a cost in fuel per lead smelted of 2s. per ton, a result which obviously indicates a rich and productive ore as well as skilful manipulation in smelting. Even admitting the latter to be an exceptional yield, still 23 pigs, or 71.87 per cent., is not unfrequently obtained direct from the hearth in selected parcels of ore.

CHAS. ROWE.

WEST CHIVERTON MINE.

SIR,—Last week's Journal contained a letter signed "Practical Miner" relative to the above mine; will you kindly allow me space in your columns to reply thereto? In the first place, the former executive only sunk the engine-shaft 2½ fms. in two years; the present company has sunk one shaft 30 fms.—from the 140 to the 170 fm. level, and another from the 130 to the 150 fm. level; and by so doing has reached the junction of the north and south lodes in depth, and proved what has been, and always would have been, a debatable question—the effect these lodes would have on each other at the junction. Unfortunately, it has been disastrous, for they have completely destroyed each others mineral producing qualities.

Again, if the 160 and 170 fm. levels had been so productive as the 140 and 150 fm. levels were, we should still be in a position to make profits out of the workings similar to the first two years of our *regime*, notwithstanding the ruinously low prices of lead and blende which we have since been receiving, and to which I shall call your attention further on. Then, perhaps, "Practical Miner" has overlooked the fact of our losing between 3000*l.* and 4000*l.* through the failure of two lead smelting firms, and which was written off the accounts as a bad debt. This, possibly, "Practical Miner" will have us believe former agents, with their extraordinary foresight and calculation, were also well able to predict. Fully 3000*l.* have also been laid out in new dressing machinery and resuscitating the old; a considerable sum of money has also been expended in repairs and replacement by new of various parts of the machinery, pitwork, &c., which, through some means, were allowed to fall into a very dilapidated state. However, I think the following statistics will conclusively prove to any unprejudiced "Practical Miner" that even with the poverty of the bottom levels and the expenses attendant on opening them for hundreds of fathoms in length, the sinking of 50 fms. of shaft, and the money expended in the new plant, &c., the whole of which was absolutely necessary for the development and the proper carrying on of the mine, that had we received the same prices for our mineral in the last three years as in the two prior ones, we should have continued to make profits, and the shareholders would not have been placed in such an unfortunate position.

LEAD ORES.

The average price received for two years to end of 1876... £13 19 0
For the three years since 10 7 0

Or a difference per ton of 3 12 0
And this on the 2652 tons sold during the latter period
leaves a deficiency of £9,547 4 0

BLENDE ORES.

The average price received for two years to end of 1876 was £3 6 2
For the three years since 2 9 6

Or a difference per ton of 0 16 8
And this on the 9834 tons sold during the latter period
leaves a deficiency here also of 8,195 0 0

Add to this dividends paid 9,000 0 0
Loss through failure of smelters 3,000 0 0
Outlay on dressing machinery 3,000 0 0

Gives a total of 32,742 4 0
Calls have been made to the extent of 21,750 0 0

And this will show a balance in shareholders' favour of... £10,992 4 0
Without reckoning anything whatever for the dead work done in keeping on a continuous sinking of the shafts and driving of cross-cuts from which not a pennyworth of lead has been returned.

Now, the foregoing facts and figures are taken from the company's books and statements of accounts issued from time to time, therefore cannot possibly be gainsaid.

In conclusion, allow me to tell "Practical Miner"—although, judging from his remarks, it strikes me forcibly his title is a misnomer—that had we not persevered in sinking the mine to prove the junction of the two lodes any really "practical miner" would certainly have blamed us for not doing so, for frequently the junction of lodes makes large deposits of mineral; but in this case it has had quite the opposite effect, which no one, let him be ever so "practical," could have foreseen.

RICHARD SOUTHEY.

West Chiverton Mine, March 18.

LEVANT MINE.

SIR,—Noticing the article which appeared from The Cornishman in last week's issue, I would like, in addition to the many very important points therein referred to, to mention just one other point, which to me appears to be the most important of all—the probable early junction of the present north lode, which has so materially increased in size and value within the last few days, with the Levant old lode. It was this latter lode which in the old working was so enormously rich, and which was the main source whence were obtained the 200,000*l.* in dividends referred to in the above-mentioned article. It is the opinion of the agent that at this junction an immense deposit of mineral wealth will be found. With the aid of the boring machine now being erected it will not take long to reach the junction, as it cannot be many fathoms distant from the point where they are now working.

In a letter which I received during this week from the manager he states—"I would not sell any of my original shares for 25*l.* each. The mine is looking well. During the past week we have been bringing up the last month's raisings, principally tributaries. There has not been so much stinff on the floors for 14 years—very much like old times, when the mine was in its glory." He further states that, notwithstanding the present decline in the price of tin—which he believes to be only temporary—he has not the least doubt of their being able to make during the present four months' working the profits which he anticipated at the last meeting.

A SHAREHOLDER.

BWLCH UNITED SILVER-LEAD MINES.

SIR,—These celebrated mines were first formed into a public company in the year 1847, at which date the market value was 40,000*l.*; and notwithstanding some 60,000*l.* to 70,000*l.* sterling of crop ores were scooped out of the backs of the lodes during a period of three decades, yet the workings were only extended some 70 fms. in depth, or just down to a point 30 fms. above the water line of the Goginan deep adit level, where the profitable chambers of silver-lead ores were first discovered at that mine. Fresh energy and vitality were infused into this company some 18 months ago with 10,000*l.* additional capital. The workings are now pushed forward with practical skill and dispatch, and it is with pleasure we note that the lode at the deepest point—the 100 fm. level—is more compact, ore, and crystallised than at shallower depths. The matrix of the lode is a congenial light clay-slate containing a good mixture of carbonate of lime and friable spar, thickly interspersed with solid cubes of silver-lead ores of considerable size, reminding one forcibly of the rich deposits found at Goginan adjoining, and in the same lodes and at similar depths, continuing to a further depth of some 150 fms., lasting over a period of 20 years, and yielding the shareholders some 9000*l.* dividends annually. Had the same practical skill and intelligence been exercised in the early workings which is now displayed by Capt. Bray and Mr. C. C. Marvin, the managing directors, some 40,000*l.* or 50,000*l.* profits would have accrued to the shareholders in seven years. From all that we can glean the Bwlch United is likely to become an important and profitable investment at an early date, and we shall not be surprised at the dividends being 10 to 15 per cent. quarterly. At 3*l.* a share the entirety of the mine is not equal to the money expended in the erection of machinery and in opening up the lodes.

If mining pursuits were characterised by more energy, skill, and practical intelligence, with less scheming and artificial finance, we should have more successful miners and mining prizes than now fall to the share of investors. It is, however, cheering to observe the

progress and success of such mines as Wheal Pevor, Wheal Eliza, West Seton, Frongoch, Bwlch United, Wheal Agar, South Condurrow, West Basset, and South Frances. Again, energy, skill, and moderate capital are alone required to ensure success at East Eliza, West Wheal Towan, Wheal Grenville, and Parys Corporation.

Mildmay Chambers, London.

R. TREDINNICK,

Consulting Mining Engineer.

LEADHILLS MINING COMPANY.

SIR,—The Leadhills Mining Company is the only one of the really large and solid lead mining companies whose shares in the face of the recent great revival in the price of lead has steadily fallen. Since last December these shares have fallen very considerably—very far beyond what could be accounted for by the slight fall in the price of lead during the past month. How can we explain this ugly fact, for fact it is? The property is one of remarkable extent in Lanarkshire, and is of very great value. The nominal capital of the company is 120,000*l.*—a gigantic sum. Some dividends have been paid, the last in the spring of 1878. I believe the explanation is a simple one. The operations at the mine have not been carried on with due care and energy, but a torpor seems to have fastened itself upon the secretary and the board. During the past depression the mine should have been developed in a spirited way by vigorously driving levels and sinking shafts, and by the use of boring machinery. Had this been done we should now have been in a very different position. Instead of returning, as is the fact, about 170 tons of lead a month, we should be returning nearly 300 tons; and instead of smelting lead at a loss we should either have learned how to conduct smelting operations at a profit or we should have ceased to do so. The mine has also been crippled by a very oppressive royalty, and by the board paying the men wages far above what English miners would have been well content to earn. It is quite enough that the dressing operations are suspended by the weather for some time every year, without adding what I have stated. I believe in some mines the lead is dressed continuously by more efficient and covered-in dressing-floors. Why cannot we have similar dressing-floors? Why should we have twelve months' costs and only nine months' returns?

The real remedy, in my opinion, rests with the shareholders. It is high time we should take this matter into our own hands, and see whether this fine property cannot again be brought into the position of a first-rate dividend-paying mine. The torpor in the management of the mine will go on unless shareholders bestir themselves, and the result of it is and will continue to be this—that no dividends will be paid, and that the property will continue to fall in market value. We want an active secretary devoted to the affairs of the company, and a competent body of directors, one of whom should be appointed managing director. Let us have a smaller board, and pay them and the secretary better. It is a bad policy to pay our managers with a niggard hand; but then, in return, we ought to have real good active management and devotion to the details of the company's affairs. Let us have the matters I have named thoroughly investigated by a competent managing director, assisted by a devoted secretary properly paid, and when the changes consequent on the investigations suggested are carried out I firmly believe we shall have the great satisfaction of receiving good dividends and seeing our shares once more stand at a good premium.

SHAREHOLDER

LEADHILLS MINING COMPANY.

SIR,—What are the directors of this company about? How is it that our monthly output of lead is so small for so extensive a concern? It is, moreover, smaller than it was some two years ago, while with proper developments the output should have increased considerably. Why does the price of our shares keep falling? I believe radical changes are needed in this company if shareholders are to gain by the recent revival in the price of lead, as they ought to do. We ought to have a managing director, and we ought to use boring machinery. By these means we may succeed in touching dividends again, and may see our shares steadily rise in value.

March 16.

A SHAREHOLDER.

DERWENT MINE.

SIR,—Your correspondent, "An Investor," desires some information as to the locality, &c., of the Derwent Mine, which, as living in the immediate neighbourhood, I am able to give him. The mine lies about 1000 ft. above the sea level, over the great limestone (down to which the workings extend), in a district which has for ages afforded profitable results to shallow workers, whose slag-heaps abound in all directions, as well to more scientific explorers furnished with competent machinery to combat the difficulties of depth. The locality is the north-west of the county of Durham, the small River Derwent (from which the mine takes its name) forming the boundary between that county and Northumberland, six miles from Stanhope, in Durham, twelve from Hexham, in Northumberland, distant about six miles from the Wear and Allendale mines of Mr. Beaumont, which lie to the west and north-west. Seven miles to the south-east is the productive mine of Healy Field, not far from the Consett Ironworks; whilst nearer still, within three miles, lie the Hexham and Edmufdybys (Limited) and Burnhope Lead Mines, the former a new venture of great promise, now selling ore; the latter a private and marvellously successful trial, working at a shallow depth of 15 fms. a vein 8 ft. wide, containing a 2 ft. rib of solid ore. The Derwent Mine is thus situated in the midst of mining successes, itself not the least promising. Though long worked it includes in its royalty an extensive tract of virgin ground, now in process of opening out, is amply supplied with machinery worked by both steam and water power, smelts its own lead ore, thus saving a profit, pays no dues, the royalty being secured, and lastly, though not least, is fortunate in the services of a thoroughly honest and competent local manager, Mr. Morpeth. I trust these few remarks may be acceptable to your readers, and encourage your correspondent in his good intentions. As to the prospects of the mine, better information than I can give may be obtained from the able secretary, Mr. Smith, at 8, Austin Friars.

W. FEATHERSTONHAUGH.

Edmundbyers Rectory, Durham, March 16.

THE DEVON COPPER AND BLENDE COMPANY.

SIR,—I have heard it stated upon good authority that there are some thousands of tons of blende already broken and thrown back in the levels of Collacombe Mine, which is now going to be pumped dry by this company to the 96 fm. level, or bottom of the mine. As I am interested in the property I shall be glad if anyone can contradict this statement, or give myself and friends some little information, blende being now 5*l.* 10s. a ton.

March 15.

A SHAREHOLDER.

THE DEVON COPPER AND BLENDE COMPANY.

SIR,—The following is a copy of a report which the late Captain James Richards, of Devon Great Consols, made for me in 1869 with regard to the above company's property. I send it for publication in your valuable Journal for the benefit of your readers.

March 17.

R. G. SMITH.

Devon Great Consols, Dec. 6, 1869.—* * * At your request I beg to hand you my report on the Collacombe Mine, situate in the parish of Lamerton; the southern boundary of which is only about half a mile to the north of the Devon Great Consols northern boundary, and being in the immediate neighbourhood of most of the other productive mines of the district, together with the lodes, being embedded in the same metalliferous channel of country, like results may be anticipated. There are four known lodes traversing this property, one of which only has been wrought upon to any great extent, and which yielded large returns of rich copper and blende ores. The old mine is sunk to the depth of the 105 fm. level, in the bottom of which, for some 20 fms. between Doidge's and the western winze, the lode is worth 1 ton of ore per fathom. The whole of the levels over this point yielded for great lengths large quantities of ore, and there is still standing in and throughout the mine, at different points, ground which will, as soon as the water is in fork and levels secured, come away at remunerative tributes. During the late working, in the course of sinking Morris' shaft below the 72 and deeper levels, the lode became very much disturbed, being in the immediate neighbourhood of two cross-courses, and slidy ground. This was the means, in my opinion, of temporarily cutting off the ore at this particular point. I would, therefore, recommend, in the event of the mine being worked, to resume sinking the main engine-shaft, which is in every respect a good one, and is, so far as already sunk, so much valuable work done towards the further prosecution of the property. You will then be enabled to speedily get under the disturbed ground, when on extending east and west in the usual way good courses of ore

are likely to be met with. A great extent of ground remains untried to the east of the main shaft, two or three levels should therefore be put out in this direction. To the south of the old workings some immense rocks of gossan—near Collacombe House—are lying about, and must have been thrown off from a lode of great strength; and for proof of this part of the sett an adit level or cutting should be brought in east from the brook, and when sufficiently advanced to be in firm ground drivages should be put out both north and south for intersection of the whole of the lodes, which I believe will be attended with success. This drivage, judging from the appearance of the ground, would give something like 50 fms. of backs, and of course the lodes could be tried in this way most economically. The engine-shaft is, as before observed, a good one; this fact, together with there being two engine-houses, account-house, dwelling-house, smith's and carpenter's shops, &c., is of course most advantageous, and so much capital saved. In conclusion, I believe if the foregoing recommendations are carried out, and the lodes fairly tried, there is every probability they will, judging from the congenial character of the country, the intersections by the cross-courses and slide, together with the other highly favourable indications presenting themselves, lead to profitably productive results.

JAMES RICHARDS.

To R. G. Smith, Esq.

MINING IN MONTGOMERYSHIRE.

SIR,—I felt highly pleased in reading an account of the Great Dyliffe meeting in the Journal, to find that the directors had at last taken the right step in putting the old mine in its former prosperous state, for there can be no doubt as to the importance of sinking Llechwedd-du engine-shaft, and opening out a new section of ground east and west of same on this productive lode. This, it is said, was the means of laying down the foundation of colossal fortunes to the Messrs. Bright, Cobden, and others, and it is greatly to be hoped that similar results will accrue to the present company from the same source, and that it will be the means of tempting them, in conjunction with other interests, both agricultural and mining, to lay down a line of railway from Machynlleth towards this and other important mines in the district—the Dyfnwgm, Rhoswydol, and Brynleduen, and others. The two last-named are at present suspended I hear, but from a personal knowledge of both they have lodes that contain a vast amount of mineral wealth to work upon, both of which could, with a small working capital applied in the right direction be made to return handsome dividends to their proprietors. Rhoswydol being well supplied with the best of machinery for dressing, which is not surpassed by any now in use; their classifiers are perfection themselves.

The mines west of Dyliffe are, on the whole, in a depressed state, but I hear that to the east of Dyliffe, towards Cefn Hafod and Van, and also east of East Van, that setts are taken up by local parties. I have just been informed that from the Cryndeg river, east of the village of Trefegleys, there is not a yard of ground that has not been taken up for mining purposes that is likely to contain a lode; and my informant adds that a very influential local gentleman has taken up Dolgwen Cae Whilding and Tolgarth, embracing some hundreds of acres, and also the Van lode, and that he purposes to form a local company to drive an adit through the hill. This will be a splendid trial, and from the high opinion held of this sett by the most experienced mining men of the district there will be no difficulty to carry this out. The late respected manager of Van held a very high opinion of this locality, and I wish this new venture great success.

MINER.

WHEAL UNY.

SIR,—I read the report of the agent in last week's Journal with some curiosity, and would ask what possible information is this to the shareholders? To one largely interested, and who knows the real position of the mine, such a report is most misleading, and the coolness and placidity with which it is written surpasses anything I have ever read even from the manager. Allow me to give a few facts. Wheal Uny from the 60 to the 130 fm. level was opening a great and progressive, and apparently splendid, property, and I well know the case of the late Mr. Dennis, a man of singularly good judgment, after most careful study buying as an investment 100 shares at 9*l.* per share. The mine is now sunk to the 170 fm. level, and I boldly assert that from the bottom of the 130 to the 170 the flat lode has never been seen, and that between those points scarcely a foot of cross-cut has been driven. About three months ago, after a good deal of badgering, a cross-cut was driven at the 160 fm. level, and after driving 3 fms. cut the lode. The same has been done at the 150, with like results, and, apparently unknown to the manager, it had been cut five years ago 3 fms. west of King's shaft, and left. Can any practical man believe that after cutting the great flat lode for two months it has been driven into 9 ft. and left, and which is frequently from 4 to 5 fms. in width, and a level driven east and west in the hanging-wall, two-thirds of which level is in the country. In a year there have been two runs at King's shaft and serious damage to the whim, at a cost which, if spent in developing this great lode by boring machinery, would make Wheal Uny a good and profitable mine. It is with great regret I write this. My object is not to frighten less informed shareholders, but to encourage them to hold on to their interest. In my opinion Wheal Uny is one of the greatest mines in the district if properly handled. There are various remedies suggested to alter this state of things, and I feel certain that free ventilation by independent men will suggest a remedy by which this great property shall be saved to the neighbourhood, and heavily-taxed shareholders benefited.

March 16.

MINER.

MUSHROOM MINES.

SIR,—A letter appeared in the Journal a few weeks ago from an anonymous correspondent who spoke of East Chiverton as a "Mushroom Mine." Such a designation was most inappropriate, because the word mushroom means quickly springing up, whereas East Chiverton has been at work several years, and must be ranked with the progressive and speculative mines. It is progressive, because it is being opened up on the lode, and as the opening progresses the returns of lead increase—if I rightly understand its character; and that increase seems to justify the expectation entertained by the manager that greatly increased returns are likely to be realised as depth is attained. If there were no lead ore raised I should not entertain much hope of any good result from further development, but a great deal of lead ore has been raised and sold. It is also speculative, because we are not sure that West Chiverton lode will be found rich so far east as East Chiverton, but we hope that it will, and that hope justifies the continued prosecution of the works.

There are many mines in Cornwall which have been longer in a progressive state than East Chiverton—West Seton, Wheal Basset, West Frances, Wheal Agar, &c., to wit; and no one thinks, I suppose, of absurdly applying the word "mushroom" to either of them. My belief is that the writer of the letter adverted to had a sinister motive for causing its insertion in the *Mining Journal*. I think it was a very unfair attempt to depreciate the property of the shareholders—perhaps with a view to acquire some shares at a low figure. Such attempts will be regarded by all honest men as highly dishonourable.

Truro, March 16.

R. SYMONS.

MUSHROOM MINES—"DEAD LOSS."

SIR,—Kindly allow me, as one of the parties alluded to in last week's Journal by "Dead Loss," as having assailed "Cautious" for pointing out the nature of the mines in the Chiverton district, to remark that I did not object to him for so doing, but for having the hardihood to attempt to run down a property by the means of direct misrepresentation. From his letter it is evident he is totally ignorant of the district and mines there, except of some few names besides the one—East Chiverton—which it is his aim to undervalue. The cause of this is not far to seek in the face of the satisfactory report from the manager last Saturday, in the *Mining Journal*. I am glad that "Dead Loss" is a shareholder in East Chiverton, as being so he will soon have the pleasure of retrieving some of his bad luck in other mines by the success in East Chiverton. I must remind him that mines are no exception to other classes of investments, and do not at once become profitable as soon as the sett is procured. Houses do not pay interest on the outlay before they are inhabitable; railways till they are working; waterworks till they are being utilised, although many thousands may have been spent for years in the construction; yet no one dreams of grumbling because they do not get interest at once on the outlay. In the same way a progressive mine must have time, the ore, however valuable, will never of itself come to surface; we must go to it, and only time and patient outlay will give good results to mine adventurers. No doubt eight years seems a long time to "Dead Loss," but so does ten years to me,

yet I have faith in the mine, and so would anyone have who visited the workings. I should advise him to do so, after which there is no fear of him playing into the hands of that very "Cautious" man.

I cannot quite understand "Dead Loss" as to the latter part of his letter and the prices of shares, although he seems to mention Chiverton in the connection. I fancy he must have some other mines in his mind, as it has not the least application to East Chiverton. If he will allow me, I say to him as a fellow-shareholder—Hold on! do not play into the hands of the bears. There is no doubt that East Chiverton is one of the best young mines in the country, and it will be proved this year.

J. B.
Stanley, March 16.

SURFACE OWNERS' RIGHT TO SLIMES.

SIR,—In reply to an "Old Subscriber," in last week's Journal, I may state that a mining lease is usually a license and authority to dig and search for metals, ores, and metallic minerals, with liberty to make any pits, adits, shafts, leats, and water-courses, and to erect engines, buildings, &c., necessary for building purposes. It is also usually provided that the metal, ores, &c., shall be cleansed, dressed, and made merchantable within the limits of the sett, and it is out of the amount for which all metals, ores, &c., may be sold after being so made merchantable that the royalty is reserved. Therefore, the lessee of a mine has no right to carry away anything from the land but the metals, ores, and metallic minerals, after they have been cleansed, dressed, and made merchantable.

B.

[For remainder of Original Correspondence see this day's Journal.]

REPORT FROM CORNWALL.

March 19.—Election matters in the county still continue to excite a great and, indeed, predominant amount of attention, which is little to be wondered at, seeing that with the exception of Truro all the boroughs are being contested, and that it has not yet been decided whether one of the two county divisions shall not follow suit. In West Cornwall, however, Sir J. St. Aubyn and Mr. A. P. Vivian are, as we anticipated, to be re-elected unopposed, and this, from a mining point of view, is so far the most notable and important feature of the local electoral campaign.

There seems now to be good reason to anticipate that tin has seen the worst of the reaction to which it has been exposed, and that with the steady revival of trade, which can be seen so unmistakably in progress in so many directions, recovery cannot be far distant. We see no reason, however, to alter the opinion we have already expressed—that the disturbing element of electioneering must be got out of the way before any real recovery can be expected.

The conversion of the Penpoll Smelting Works into a limited liability company must be regarded as a decidedly experimental undertaking. Hitherto direct personal proprietorship has been the only way in which smelting has been carried on with success. In fact, it is the personal element which has made smelting the predominant power that it has become. However, if limited liability can be applied to smelting operations, it starts in this case with the very best chances of working its way; for by no hands could the principle be applied better than by those of Messrs. Strauss and Capt. Teague.

A little knowledge, as we all know, is sometimes a very dangerous thing, but no knowledge at all is a great deal more so. It is not everybody who professes to be a miner who "knows tin." A few days since there appeared in a west country paper, not published, however, in this county, an account of the discovery of a magnificent lode of tin on the flank of Dartmoor. The communication was printed in all good faith, and the good faith of the communicator is attested by the fact that he has laid out a good deal of money in employing men to drive into the hill and raise a quantity of this rich tinstuff. Unfortunately, however, for him, he knows a great deal more about farming than about mining, and this wonderful tin lode of his turns out to be nothing more than a vein of schorlaceous rock, such as is common between the Dartmoor granites and the bordering killas, thickly sprinkled with schorl crystals. Of course no one who knew anything at all about tin could have made the blunder, but to the utterly ignorant no doubt the appearance would be deceptive. This is only another phase of the more frequent blunder of taking mica or mundic for gold. However, as all is not gold that glitters, so all is not tin that is found in black crystals. The moral of this story is that those who think they have found a mines should take professional advice, if not themselves practical, ere they spend their money, and that people should be careful to ascertain the authority upon which such statements as those to which we have referred are made before putting implicit confidence in them.

IMPORTANT DECISION.—THE VICE-WARDEN'S JUDGMENT REVERSED.—The case of the Ambrose Lake Tin and Copper Mining Company was brought forward on Tuesday, on appeal from the Vice-Warden of the Stannaries Court, in the Court of Appeal, Lincoln's Inn, London. The mine is situated in St. Neot, and the Vice-Warden had made an order upon Mr. Joseph Taylor and Mr. Moss for the payment of 10,185*l.* and 6825*l.* respectively, for transactions relating to the acquisition of the mining company, which is now being wound up. Against this order they appealed, and, after a long discussion, the appeal was allowed. Costs were refused.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

March 18.—Lead mining in Derbyshire appears likely to be more active during the present year than it has been, seeing that at some few mines there has been an outlay of capital for the purpose of developing them. This is all the more important, seeing that from the last returns there were not a dozen lead mines in the county that could be said to have paid, those that could really be considered as having been carried on at a profit being the Mill Close, near Matlock, and owned by Mr. Wass, and from which he drew nearly one-fourth of all the lead ore raised in the county. Next to it was the Mill Dam (Great Hucklow), from which nearly one-fifth of the entire yield was obtained. Then follows Wakebridge, Peak Forest, Eyam, and Bage, so that there were 30 mines that raised less than 50 tons of ore during the year, whilst there were no less than 130 mines that produced an average of less than 5 tons each. It will, therefore, be evident that there is plenty of room for improvement in lead mining in Derbyshire, for there must be large reserves of ore in the county yet untouched, but only require capital and experience to bring to light and be made to pay fair returns to investors. No doubt, were the existing mining customs abolished, and a reasonable and equitable system adopted, there would be more ore raised in the county, and instead of working men becoming mine owners that position would be occupied by capitalists, aided by practical men.

The collieries in North Derbyshire and along the Erewash Valley are by no means so busy as they have been, the mild weather telling strongly against the sale and consumption of house coal in all parts of the country. The London trade has declined of late less, having for some weeks past been sent from Clay Cross and other places, and no improvement can now be expected, but just the reverse. Prices, too, have been particularly low to consumers, good households being delivered as low as 20*s.* per ton, and Silkstones at 22*s.* Merchants may be doing tolerably well, as they are able to fix the charges to their customers, but such is not the case with the colliery owner, who of late has found the London market glutted with coal, and has been obliged to sell without any profit whatever, and only too glad to escape a positive loss, which he has not always done. Steam coal is beginning to sell more freely, there being a large absorption by the furnaces in blast, whilst the railway companies are increasing their consumption, but as yet there has been no increase in the price, which has been at anything but a paying point for many months past. Engine fuel also sells better, a good deal being forwarded to works in Lancashire. The ironmasters in Derbyshire have been doing a steady trade of late, there being less fluctuations and speculations, whilst prices have come down, so that forward deliveries are nearly out of the question at the present time. The mills and foundries continue to be fairly employed, and some of the latter are much busier than they were.

In Sheffield trade is in a more settled state than it has been for some time, and affairs appear to have got into something like the old groove again. Pig having come down in price consumers purchase more sparingly than they did, expecting, of course, that the downward movement will go on. In manufactured the business may be said to be good, and mills are working well. Heavy as well as boiler and ship plates are in good request, whilst there is a steady output of hoop-iron, and telegraphic and ordinary wire. The make of Bessemer is large, whilst there has been no decline as regards the production of steel rails, considerable orders being in hand for home and other railways. There is, however, some appearance that prices of these will come down, seeing that hematite pig is considerably lower than what it was. Railway materials, including tyres, axles, wheels, springs, points, and buffers continue in fair request, whilst railway wagon builders are also busy. Of late there has been a marked increase in the make of crucible steel for various purposes, especially castings. The cutlery houses are working steadily, whilst there has been a marked improvement in the demand for files, a branch that during the greater part of last year was particularly quiet.

In South Yorkshire the Coal Trade has become quieter, so far as the soft or house coal is concerned, and some of the collieries are working less time. Still, considering the time of year, business may be said to be fully up to the average. A good deal of coal has been sent over the Great Northern to the Metropolis, but the prices owners are obliged to take does not leave any margin of profit, and in some instances it is said that pits are being worked at a loss. Steam coal is getting into more active request, and owners are now looking forward to the opening of the Baltic, and the commencement of the shipping season to the North of Europe. Coke is in fair request, and a large tonnage is being sent into Lincolnshire as well as to Sheffield.

In Leeds and the district there has been an improvement in some branches of the iron trade, and some heavy orders have been placed for tools, whilst makers of locomotive engines are now working well. The forges are working to the full extent, and at one of the leading establishments the premises are about to be enlarged, owing to the marked increase of business. The collieries in West Yorkshire are anything but busy, and stocks of house coal are accumulating.

At the Barrow Hematite Colliery the dispute has been settled, and work resumed. At Monk Bretton, however, the men are still out, and show no disposition to give way, relying upon the support of their fellows who are working.

NEW PATENT COLLIERY CORF.

MR. TAYLOR, of Gilroyd, near Barnsley, has just made some improvements in his recently patented mining corf, which has been set to work at the Morley Colliery, near Leeds, where it has given every satisfaction. The corf, it may be said, is particularly well adapted for mines where the seams are thin, and the space between the floor and roof of moderate height, not allowing of a conveyance on wheels more than perhaps 3 or 4 ft. in height at the most. The wheels are cast with taper centres on each side, 1½ in. diameter at the wheel, and tapering down to ¾ in. at the end, so that when the corf is running upon the rails it sits with perfect ease on the conical centre of the wheel, the end of each centre running against the pedestals, whereby the gauge of the wheels cannot possibly get wrong. The wheel cover and pedestals are in one piece, secured to the plate by means of two ¾ in. half-headed bolts or rivets, as preferred, the half head coming over the end of the wheel centre ¾ in. to prevent the wheels leaving the place when being tipped or otherwise; this plate being made (say, ½ to ¾ in.) with a flange 1½ in. deep all round the outer edge, is of great strength, and will withstand any amount of strain as compared with a light wood frame. Not only does the flange give strength to the bottom, but also to the boards forming the sides of the corf, which sit inside the flange, whereby it prevents the coal or other material from forcing them outwards. This flange at each corner is thrown up 3 in. to secure the corner plate with two ¾ in. rivets. The corner plates are simply made from sheet iron ½ in. thick. With this all that is required for completing the corf is the bolting on of the sides and ends with ½ in. bolts, these being the only bolts or plates required in the construction of the corf. The wheels run partly inside the corf—which can be made to do so—say, one-third, one-half, or two-thirds, as may be necessary for thin seams of coal or other mineral, which must necessarily be of great advantage to proprietors as saving the oft-required necessity for ripping or taking down of roof as well as to the miner. Although the corf is made to run from 4 to 7 in. lower, still having the same carrying capacity, the incline pulley can be placed 2 in. higher or more, there being no axles to pass over the pulley—in fact, the coal rides as low as the pulley, save the thickness of the bottom ¾ in., and a small allowance for contingencies arising from displacement of elevation of pulleys. It is an acknowledged fact that the lower a weight is carried the easier and better a corf will run, and be less liable to get off the road. Another important advantage is that the wheels being independent of each other will run much easier, and pass round the most acute turn—a feat not easily accomplished with fast axles. Another advantage is that the wheel and centre being cast together they must necessarily be perfectly true, so dispensing with the boring or turning of axles. In the case of a run-away or collision the only parts of the corf likely to be injured are the boards, which can be replaced in a few minutes. As the bottom plate, which includes buffers, drawbar, &c., is all cast of malleable iron, steel, or forged in one piece, the only smith's work required is two hooks and rings or shackles. The putting together or repairing of the corf is comparatively nothing when compared with the frame of other corves, which owing to their construction are constantly being twisted and put out of gauge. The patent corf will run with any other kind, although running so much lower. In case of tipping where the catch is by the axle, the corf can be tipped by the top edge.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

March 18.—The collieries where furnace and forge coal is mined have not all the work which they would like, and which, if the revival in the iron trade had fulfilled the expectations that were formed of it when the year opened they would have had. Competition from outside districts is robbing the house coal raisers of not a few orders, and hence their position, too, is not altogether satisfactory. Still, there is less complaining than a week or two ago, the lower prices having encouraged business. Pig-iron makers are steadily at work, and the orders upon the books are sufficient to relieve them of an amount of anxiety which, if they were not booked forward, would be occasioned by the quietude in new business which is now manifest. The consumers who are most disposed to buy at present are the foundries. Messrs. Roberts, ironfounders, of West Bromwich, have just relighted a second furnace at the Brade's Hall Works, Stour Valley, which they have recently purchased.

The current demand for manufactured iron is checked by the approach of the Quarterly Meetings, which are fixed for the 7th and 8th of next month in Wolverhampton and Birmingham respectively. United States orders for high-class bars continue to arrive, but the Transatlantic demand for hoops has almost ceased; consequently, the price of hoops is easier, and they were this week to be had at less than 9*l.* The sheet makers have not all the specifications they would like, and angles are easy at from 10*l.* 10*s.* to 11*l.* For latens 14*l.* is asked, but consumers are unwilling to give the figure.

Upon 'Change in Wolverhampton, on Wednesday, much satisfaction was expressed at the progress which is being made with the sinkings at the Hamstead Colliery. During the past fortnight 14 yards have been gone through, and the evidences, which become increasingly satisfactory, leave no doubt that the Thick coal is at the customary depth under the splendid seam of brooch coal already found.

The revival in trade has favourably influenced most of the public properties connected with the iron and coal trades which are quoted upon the Stock Exchanges. The shares of the Great Sandwell Park Colliery Company are quoted by sellers at 9 prem. The discoveries of coal upon the Hamstead estate have improved the position of that property, until now sellers quote only ½ dis., and the stock would be doubtless at a premium but for the fact that a call of 1*l.* per share falls due on the 22nd inst. The 100*l.* (80*l.* paid) shares of the Can-

nock and Rugely Colliery are quoted by sellers at 200*l.*, but buyers only offer 150*l.*: 1 dis. is asked by sellers in the Mid-Cannock Colliery. Holders in the Cannock and Leacroft Colliery are willing to sell out at 20 dis. For the Walsall Wood Colliery shares 1½ dis. is demanded, but buyers hold off at 4 dis. The Pelsall Coal and Iron stock has been done this week at 3 dis. Holders in John Bagnall and Sons quote ½ dis. for the 3*l.* shares. The 10*l.* shares of the Chillington Iron Company are priced by sellers at 6*l.* Buyers of the Horseley Engineering stock stand at 4 dis., but there are no sellers at this figure. The 17*l.* shares (7*l.* paid) of the Patent Shaft and Axletree Company are priced by sellers at 1 dis., but buyers stipulate for a further 10*s.* off. The Staffordshire Wheel and Axle property is quoted at 3-16ths dis. Buyers in the Railway Carriage Company (Oldbury) quote 5*s.* dis., but without success. A property upon the market that occupies one of the best positions is the Patent Nut and Bolt Company, for which buyers offer 7½ prem., with sellers at 10*s.* higher ex div.

TRADE OF THE TYNE AND WEAR.

March 17.—There has been a great arrival of steamers and large sailing vessels, and the shipments of steam coal have been heavy on the north side of the Tyne. The demand for good small coal is also very active, both for shipment and local consumption. The Steam Coal Trade in Northumberland is expected to be very active this week. The Gosforth Colliery, which has been closed two years, has been reopened, and good steam and house coal is being raised. The shipments of coal from Tyne Dock continue below the average, and the Gas Coal Trade is rather slack, but the bulk of the collieries in Durham continue to be well employed, as the Coke Trade especially is well maintained, and most of the works have contracts which keep them fairly employed. The London market for coal shipped from this district is in a very depressed state; it appears that the merchants there continue to be masters of the situation, the movement made lately—or perhaps it is more correct to say the agitation to get better prices for the coal sent there—appears to have entirely failed. It seems that the London merchants reduced their charges some time ago to the consumers, but at the present moment their profits are quite as large. The top price on March 16 is 15*s.* for Hettons, and the rate charged for the same coal to the consumer is 24*s.* per ton, and as the colliery owner has to pay from 1*s.* 6*d.* to 2*s.* per ton commission, and also the freight, he gets much less for working the coal than the dealer gets for distributing it in the Metropolis. It has often been proposed that the northern coalmasters should appoint agents to sell their produce in London, but this arrangement, which appears to be calculated to remedy the present serious evil, has never been carried out. The Fire-Brick Trade continues brisk, and there is a good demand for all kinds of fire-clay goods, sanitary pipes, &c. In the general trade of the district there is a lull, and various causes are assigned for this, but there is no doubt that the serious condition of Russia is having a very bad effect on the continental trade. The Baltic trade is not opening out so well as was expected, but this is simply owing to the want of confidence on the part of merchants, who are afraid to enter into large engagements, owing to the uncertain state of affairs in Russia and the East. It must also be noticed that in January and February there was a little too much speculative business here.

The Iron Trade continues to be much disturbed. Prices have continued low, and about 57*s.* No. 3, with about the same rate for No. 4 forge, has been the ruling quotation amongst middlemen to whom the transactions have been confined. Shipments of iron have not been quite so large this week. Merchants find great difficulty in getting the iron from the makers. Practically, makers have not reduced their quotations, and they are confident that the present relapse will pass away, and prices will be as strong as ever. The American market is quieter, but it is expected to recover again soon. Messrs. Downey have blown two furnaces in at Lackenby during the present week, and more are being prepared in the district. The manufactured iron trade has also been quieter, and prices weaker. Plates 9*l.*, bars 8*l.*, angles 8*l.* 5*s.*, puddled bars 5*l.* 15*s.* net. The bulk of the manufacturers are well employed.

The ironworks, foundries, and engine-works are generally well employed, and the iron-shipbuilding trade also continues pretty brisk. Messrs. Hawkes and Co., Gateshead, are engaged on some large bridge-work, and also extensive chain contracts and other work for the British Government. At Messrs. Hawthorn and Stephenson's works, in Newcastle, good orders are in hand. At Black and Hawthorn's, Gateshead, the works are fully employed, and some extensions are in progress. The iron trade on the west coast in West Cumberland continues good, and there is a great demand for the famous hematite iron ore of that district. In order to secure a quicker dispatch of the ore a large increase has been made in the rolling stock by many firms—the Derwent Iron Company, Lonsdale Iron Company, Gillfort Park Iron Company (Egremont), and others. As regards the production of iron ore new shafts are to be sunk at many works. The Maryport Company will sink a new shaft at Gutterby. The stocks accumulated by the Crossfield Company are almost cleared away, and many other large stocks are being rapidly reduced. At Wood-end, Messrs. Lindow have sunk a new pit. The Cleator Iron Ore Company have also finished a new shaft, and opened other old mines which have long been closed. Everywhere in this mining district new mines are being opened, and every exertion made to increase the output of ore to meet the demand and realise the prices now received for this valuable iron ore. The price is greatly in excess of that got last year.

At Middlesbrough there was a good attendance on Tuesday, but the tone of the market was flat. The low prices ruling for Scotch iron and the less demand for America tend to depress sellers, and middlemen are offering at reduced prices. There was a better shipment of manufactured iron—nearly 8000 tons. A good demand for pig-iron is expected from the Continent, and the American demand is also expected to revive again shortly. Hematite iron has fallen considerably here. Manufacturers generally are well supplied with orders. Bars are 8*l.*, and angles 8*l.* to 8*l.* 5*s.* There is an increased make of steel, and orders for steel rails are coming in. There is no change in the coal trade, and coke is rather weaker. Mr. Bowman offered for sale the West Hartlepool Rolling-Mills and Blast-Furnaces and the Stanton Iron and Steel Works, but there was no offer.

REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

March 18.—At the Pontypridd Police Court a late check-weigher has charged the Cymmer Colliery Company with dismissing him illegally, and he claimed the sum of 4*l.* in lieu of notice, and it appeared that in consequence of some dispute the man was put to do other work than he alleged he was engaged to perform. He refused to do it and was discharged. The Bench decided in favour of the complainants and allowed costs.

Last Thursday was a day which will be a memorable one in the history of the town of Newport. The new station in High-street was opened by the directors of the Great Western Railway and the traffic of the Monmouthshire, Brecon and Merthyr Lines will soon be concentrated at the central station. In the evening a grand banquet was held at the Albert Hall, when about 250 gentlemen, many of them freighters on the railway, were present, at the invitation of the Great Western Board. It was generally admitted that the amalgamation of the Monmouthshire with the Great Western would be a benefit to the district. Among the company present were Sir Daniel Gooch, Chairman of the company, who presided; Sir Alexander Wood, Mr. Michell, and Mr. Walter Robinson, directors; Sir Geo. Walker, Bart., Mr. John Lawrence (vice-chairman of the Monmouthshire), the Mayor of Newport (Mr. H. Russell Evans), Mr. J. Firbank, Mr. B. Whitworth, M.P., and Mr. T. Corder, M.P. Mr. Whitworth spoke hopefully of the prospects of the iron and steel trades, especially as regards the American demand. It may be added that it is understood the Midland Railway Company intend to offer strong opposition to the proposed purchase of the Monmouthshire by the Great Western. The object is, if not to prevent the amalgamation altogether, to secure running powers to themselves over the Monmouthshire branch.

As for the Iron Trade of the district, little fresh can be noted,

and, although prices in America are not quite so brisk, makers hold out for and obtain, as a rule, recent quotations. Prices, however, have been somewhat flatter during the past few days, although quotations are nominally unchanged. The demand for America seems to hold out very well, and masters' books are, as a rule, pretty well made up for some time. Indian requirements are also being completed, and the continental demand seems to be looking up a little. Clearances have mainly been to the United States and India, and have been large. The rail departments at the works are fairly brisk; but no change can be noted in quotations. Bars are in better demand on foreign account, and some of fine quality are being turned out at Cyfarthfa. The old Cyfarthfa brand is still going forward in all directions, and seems to be as well esteemed as in the palm days of that vast establishment. Pig-iron finds a ready sale when offered; and for scrap-iron, in many cases, high prices are given. The quantity of iron ore arriving, principally from Spain, is not quite so large. Prices for ore have gone up, but only to a trifling extent. It is understood that the new firm at Hirwain intend to start their works as the Stuart Iron and Tin-Plate Works.

The Tin-Plate Trade has not materially changed. Prices are not quite so well maintained. The Coal Trade has not materially altered during the past few days. There can certainly be said to be no change for the better in prices, and, honestly speaking, the latter are scarcely so well maintained. Large contracts are now reported to have been taken at current rates, and there really seems no prospect of a change for the better at present. House coals are in moderately good request; but shipments of steam are very large. Work is a little brisker at many of the collieries. At the Bedwelly Pits, Tredegar, four men have been killed by an explosion of gas, and others injured. The Patent Fuel Trade has not been brisk, but orders come to hand more freely. Coke is a fair sale at late rates.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

March 18.—I would this week ask my readers to accompany me on a mining journey from Wrexham to Holywell. We will travel by rail to Rhylmyn, and then on foot along Halkyn Mountain to Holywell. We assemble at the Wrexham station of the Wrexham Mold and Connahs Quay Railway at 9:30 A.M. There are on the platform, as there always are at this hour, a good many mining men on their way to collieries, ironworks, and lead mines in the neighbourhood, and if I thought they would take the description in as good humour as I should write it I would give a pen-and-ink sketch of those present to-day. But as there is some uncertainty about this I had better, perhaps, refrain. I may say generally that for the most part they are strong, good-looking men, some of them advancing in years, with marks of grey ripening upon them; their countenances marked by firmness and repose, through which, perhaps, is discernible a tinge of seriousness, amounting possibly to anxiety. Most of them will have a hard day's work before they gain their homes in the evening. Most of them, too, while I have been talking have taken to the soothing influences of pipe and cigar, and we are off. And, first, about the railway itself. It is nearly 20 years since, in the days of railway mania, it was started to supply a want felt by the mining industries through which it passes. The original scheme was a bold one. It was to be a line from Liverpool to Stafford. Leaving Liverpool by a tunnel under the Mersey—a part of the project now in course of construction—across the promontory of West Cheshire by a high bridge over the River Dee, near the little port of Connahs Quay, which was thus (as it has, indeed, to some extent become) to become a port of considerable importance, then by the Buckley Mountain Collieries, brick and pottery works, to Wrexham, and thence through the plains of Cheshire and Salop to Stafford. The entire scheme was revived in 1872-3, but Parliament only gave its sanction to the heavy works along the northern half of the line, but refused the length from Wrexham to Stafford. Some day perhaps will see the whole project completed. The little length along which we travel has a very well-begone aspect, as all grand projects have when they fail of their original purpose and step suddenly, as they do, from the sublime to the ridiculous.

Just outside of Wrexham we see on our right as we face the engine the important colliery of Wrexham and Acton. It is the most northerly of all the North Wales collieries, and is the pioneer of what in the future will be colliery enterprises to win the coal measures as they pass under the Vale Royal of Cheshire as far as they can be followed in depth. The colliery is well equipped and managed, and its coal wagons are the best loaded on the railway. Its shafts are between 300 and 400 yards deep, and they are very carefully constructed, as they need be to keep the water from 200 ft. or so of loose ground out of the workings.

Near the station of Gwersyllt, or Wheatheaf, we cross the Great Western branch line coming down from the collieries and ironworks grouped around Brymbo, and whose chimneys we see before us on our left. There are their representatives, the wagons, bearing the names of Westminster, Brymally, Ffrwd, Cae Pen Ty, and Brymbo. Further on a branch line leads out of one railway towards several of these works, which thus have double railway communication. The bulk of the coal is sent to Birkenhead for steam purposes, but a large district trade is done in addition.

Passing to Cefn-y-bedd station we see the Llayhall Colliery and Brickworks, and beyond a colliery belonging to the Lilleshall Company; and then for a few miles we cross the ridge of carboniferous limestone and millstone grit that divides the Denbighshire from the Flintshire coal field, which were I doubt not originally continuous. At Hope junction we leave the line, and change to the London and North-Western line from Chester to Mold. Before we do so we catch a sight of the chimneys of the collieries and brickworks of Buckley Mountain, which we may visit another time.

We soon pass the works of the Flintshire Wagon Company and Oilworks, where the canal of the district is or was made into paraffin oil and its products. A colliery here and there, too, shows us that we have entered upon the Flintshire coal field, and we can see the collieries extending south-west towards Nerquis, and beyond are the limestone ridges that run from Minera to Llanarmon, on which here and there, as it is a clear day, surface mine work stand out against the sky. As we near the town of Mold the collieries to the right and left of us have at present a deserted aspect, but we hope that with the new winnings now in progress prosperity and activity will return. In a little time we have crossed the western edge of the coal field, along which are numerous little trial shafts, and we alight at Rhylmyn station, where, before we start on our walk over Halkyn Mountain, we will rest and refresh ourselves at the village inn, which is kept by a miner.

CHATTERLEY IRON COMPANY (Limited).—An extraordinary general meeting of shareholders was held on Saturday, at Manchester, in pursuance of a scheme of reconstruction which has recently been adopted with the sanction of Vice-Chancellor Malins. The liquidators entirely approved of the reconstruction arrangements. Mr. Alderman Hopkinson presided. On the motion of Mr. S. R. Platt, seconded by Mr. F. Monks, it was resolved that the whole of the present board of directors should cease to be directors of the company, and Messrs. J. Hopkinson, W. Richardson, C. E. Lees, F. Bishop, M. F. Blakiston, and C. J. Schofield were appointed in their stead. It was further agreed, on the motion of Mr. R. Walker, seconded by Mr. W. Bowden, that the capital of the company should be increased by 125,000*l.*, divided into 5000 preference shares of 25*l.* each. A confident belief was expressed by the several speakers that under the new scheme and with the increased capital the company would have a prosperous future.

EPPE'S COCOA—GRATEFUL AND COMFORTING.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Eppe has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Chico Service Gazette*.—Sold only in packets labelled—JAMES EPPE and Co., Homeopathic Chemists, London."

Meetings of Public Companies.

CONSOLIDATED MINING COMPANY.

The ordinary general meeting of shareholders was held at the City Terminus Hotel, Cannon-street, on Wednesday, Mr. H. W. SPRATT in the chair.

Mr. C. CADOGAN (the secretary) read the notice convening the meeting, and the report and accounts were taken as read.

The CHAIRMAN said this might be considered the first general meeting of the Consolidated Mining Company, although in the form it was called the second meeting. As many of the shareholders were aware, it was necessary to hold a formal meeting to comply with the requirements of the statute. The shareholders would have been called together at the end of October, as mentioned in the Articles of Association, but the directors were anxious not to call a second or useless meeting (knowing that the tunnel, upon which so much depended, was being driven very fast) until they should have some definite information to give to the shareholders. The Act of Parliament insisted that a return should be made to the Registrar, and that return had been duly made, so that they were legally in perfect order, though they were in default with the shareholders to the extent of holding the meeting in March instead of October. Accompanying the report a statement of accounts made up to Dec. 31 had been circulated. A reference to that would show that the "business, goodwill, property, and assets of the South Aurora Consolidated Mining Company (Limited), taken over for the liquidators of that company, under agreement of July 22, 1878," was set out at 97,000*l.*, and whatever property the old company possessed, good, bad, or indifferent, had been conveyed to the Consolidated Company, and now formed part of the assets of the company. The next item was "mining rights, plant utensils, tool materials, and assets of the Lama and Olmetta Copper Mines, Corsica, 10,000*l.*; liabilities as per contract, 39,067*l.* 16*s.* 11*d.*—13,906*l.* With regard to the first item of 97,000*l.*, he should mention that, besides their property in America, it included a property in what was called the Mammoth, but was now known as the British Tintic Company, and he made it his business yesterday to enquire how the property stood, and he was informed by Lord Claud Hamilton that they had received a most extraordinary offer for the property, and a letter was shown him with an offer which seemed to him to be of a rather fabulous character for the mine. If the mine turned out anything like what was expected those interested in the company would have to congratulate themselves. He was a shareholder in that company to the extent of 1000*l.* He was told that the owners of the adjoining property had received an offer of 81,000,000 for their property, and had refused the offer. It must be a very rich property, or the Americans, who look on the "almighty dollar" with a very keen eye, would not have made such an offer for it.

A SHAREHOLDER asked what interest this company had in the British Tintic Company?—The SECRETARY replied that they advanced 1000*l.*, for which they held 1500*l.* in debentures and 1000*l.* in fully paid shares.

The CHAIRMAN said, indeed, in the 7,000*l.* was the investment which they had made in the Gilbert and Chandler Company of Canada, which was now called the Canada Gold Company. He introduced that property to this company, and he was sorry to say that though his colleagues perfectly agreed with him on the subject his proposition to the shareholders was lost by one vote, and the property had been turned over to the Canada Company. He had never lost his faith in the property, and having again invested money in it he was a director of the Canada Gold Company, which was now realising what he would have been glad to have seen realised for this company. Though they were only scratching the ground they were getting from 5 to 6 oz. of gold a day in the winter while the snow was on the ground, therefore he thought the investment of 4000*l.* made by this company, for which they had an interest of 14,000*l.* or 15,000*l.*, would come back to them. With respect to the Corsican properties, since he last had the pleasure of meeting the shareholders the whole of those properties had been vested in this company. In 1875 the directors issued a pamphlet, in which they gave a full account of these properties, including the whole of the reports made by the engineers sent out by the company, and from this he found that the Olmetta concession covered an area of 10 square miles, and the Lama 20 square miles, which in a small island like Corsica was a very large area; but one thing which struck him very much was that the French Government insisted on the company trying the ground not at one point but at several points, so that they might know that the company was going to mine and not merely prospect. The French Government had granted the concession, having satisfied themselves from the reports of their own officers—men of high standing, who went over the property periodically—that the property was valuable. The officers of the French Government had given them gratuitous advice, but they were very conscientious in giving their advice. They had in Corsica property enough to make a dozen or twenty mines if necessary. The directors did not intend to work these mines, as they had invested a considerable sum in them, and had gone as far as he thought they should go. They were now the absolute property of the company, the same as the Nevada mines were, but instead of working them they intended to lease them to others who might form companies to work them, either paying this company a royalty or part of their share capital. (Hear, hear.) The Corsican mines were, of course, nearer at home than the Nevada property, but it was thought better to follow up the development of their legitimate property. On the other side of the balance-sheet they had an item of 133*l.* for sundry creditors. Some of their friends had lent them money from time to time at the very moderate rate of 6 per cent. interest; and these gentlemen were perfectly willing to take their money in shares and debentures, so well were they satisfied with the prospects of the company. There was a sum of 600*l.* for the directors' fees for eighteen months—as usual, unpaid—though when a company was not prosperous it required five or six times as much attention as when the success of the company made the position of the directors a bed of roses. In his experience he had only been a director of two companies, where he had had little to do; but he had had a good deal of rolling the stone up to be rolled down again—in fact, he had studied Sisypheus and his labours as much as most people. With regard to the Nevada property the report stated that—"It will be in the recollection of the shareholders that a contract had been entered into with the Eberhardt and Aurora Company, prior to the reconstruction, to drive a tunnel into Treasure Hill, Nevada, and this contract was taken over by the present company with a view to develop the company's property, and the directors had the satisfaction to announce, by circular of Jan. 21, 1880, that a lode had been discovered in the tunnel on entering the company's ground." This was exactly what he expected, as it had been prognosticated by Capt. Drake, who was a thoroughly practical man, not of a sanguine turn of mind, and possessing the entire confidence of the Eberhardt Company. He had been very pleased with the straightforward way in which Captain Drake had dealt with the matter. He believed there was a vast deposit of mineral in the hill, and after discussing the matter it was decided to join in the driving of the tunnel, which was now *un fait accompli*. On Feb. 29, in a letter to Mr. Applegarth, Captain Drake used these words: "I consider the directors' entire list of shareholders of this hitherto unfortunate company have advanced a 'round' upon the 'ladder of prosperity' by the fortunate and favourable discovery which has been made of late in driving the Eberhardt and Aurora tunnel through your ground." He (the Chairman) was very pleased to read that, for they had been waiting for it. Capt. Drake informed them that the tunnel had been driven 4875 ft. from the Eberhardt and Aurora Mine, from which it would seem that it was a very extensive affair. When the lode was struck they would have about 2000 ft. to work through, and if the lead carried up there would be a tremendous field before them. Capt. Drake said—"I think it is safe to say that the greater portion of the lode is in the ground. The ore found is not in the form of large quantities, neither is it of high grade, yet it is sufficient to satisfy the most sceptical that there is ore at great depth in Old Treasure Hill, and judging from the very rich deposits that have been found near the surface, we can safely expect large bodies of ore below. As for myself I have the greatest confidence in the final result of your property." When such language as that was used by a man like Capt. Drake it must not be slightly dealt with. He added—"This body of ore should be opened out, and I would suggest that you should devise means whereby it could be done. I do not know the financial standing of your company, but should you not have the money in hand it could easily be raised on so good a showing. To show you my confidence in the outlook here, and believing by judicious and energetic work your property could be made profitable, and in case you are obliged to raise money upon debentures for this purpose, you can put me down for 100*l.* as a start." Now, 100*l.* was a small sum of money, but he would rather have such an offer from a practical man like Capt. Drake than one of 1000*l.* from a gentleman who knew nothing about the mine except what he was told. The letter was written to Capt. Drake's personal friend, Mr. Applegarth, and he thought it should give the shareholders confidence in the property in the future. The question of raising money by debentures had been thoroughly discussed, and resolutions would be submitted to the shareholders at the extraordinary meeting authorising such an issue. It would be proposed to authorise the issuing of ordinary shares at 30*s.* each in exchange for the debentures, whenever the holders wished so to exchange them, and though they were under that price now, he believed they would go higher, and they were now honestly worth 2*l.* or 3*l.* each. In his second letter Capt. Drake said—"The material at present looks very favourable for the coming year or again," and in a third letter, which had not yet been published, he said—"The formation of the ground is very favourable for the ore." With respect to the next paragraph in the report, the whole of the directors retired, in accordance with the Articles of Association, and being eligible offered themselves for re-election. Now that the prospects of the company were so much more cheering, three or four gentlemen had offered to fill the vacancy caused by the retirement of Mr. Gould; but if the shareholders thought fit, he would ask them to leave the selection of an additional colleague—if one should be required—in the hands of the board, who would get the best man they could from amongst the shareholders. Having stated that the appointment of auditor rested with the meeting, the Chairman moved the adoption of the report and accounts.—Mr. TOWNE seconded the motion.

Mr. BURROW asked what remuneration was fixed for the directors?—The CHAIRMAN replied that it was to be 100*l.* a year each, but they had not yet received anything—it was really a promise to pay. In reply to a further question the Chairman said he did not think there was any necessity to increase the number of the directors, and any addition would, of course, involve an additional outlay of 100*l.* when the company was in a position to pay it.

Some further questions having been asked the CHAIRMAN, in reply, said there was no provision in the Articles of Association for the holding of half-yearly meetings, but the directors would at once communicate any important news to the shareholders, and if necessary they would call a special meeting, as they had full power to do. (Hear, hear.) With respect to the Corsican mines, there was no doubt that they would be able to lease them on satisfactory terms, which would be better than spending any more of their own money on the properties. Some copper ore averaging about 13 per cent. of copper had just come to this country from a mine near their property, and he had himself shown some specimens of ore from their Corsican properties to a thoroughly practical authority, who expressed his perfect astonishment that the company had not received any definite offers for the mines. In the returns of the Mining Society of France the Corsican mines of this company were both marked "good," and he thought there was no doubt that the company would receive from these properties a good deal more than their capital, without touching the original mine at all. With

respect to the shares in the Tintic Company, this company advanced 1000*l.*, and for that they had 1500*l.* in the debentures and 1000*l.* in the shares of the Tintic Company, and they also had an interest of 14,000*l.* in the Canada Company. As to the raising of capital—they had no capital, hence the necessity of raising some. Up to the present time the directors of the company had raised the money required amongst their friends at 6 per cent., but there was, of course, a limit to all things, and the gentlemen who had lent the money, and who were willing to take debentures and shares in payment of their loans, very fairly considered that the shareholders should now do their part. The money would not be required quickly, and it would only be called up as required to develop the lode, for it was very desirable that they should prosecute the ore lead as soon as possible. Their mill had cost 30,000*l.*, and that would be brought into use, and they had tailings estimated to be worth fully 4000*l.*, to treat which they only required the water. The water question was one fraught with a great deal of difficulty.—The motion was then carried unanimously.

Mr. APPLEGARTH, in response to an invitation to say a few words with respect to the mine, said that he had virtually received nothing from Capt. Drake that he had not submitted to the board, but he did not think the shareholders generally appreciated what it meant to cut the lead in the tunnel at a depth of 1400 ft. perpendicular. To take it on the run of the lead, there was more than 2000 ft. to drive up and back to work out, and if they got into pay ore, which he had very little doubt of, they would then have a big mine overhead, with all the work to fall down into the tunnel, without any hoisting or expense for water or dead work. They could work in the winter as well as in the summer, and they would be able to extract the ore at about one-half of the amount that it used to cost them. From the tunnel downwards their mine was in entirely virgin ground. There was no water in the tunnel, and he thought it probable that they would not be troubled with water in that formation, so that the mine could be developed downwards on the tunnel very cheaply. The average of the ore raised from the South Aurora Mine had been 35*l.* to the ton; and if, therefore, that percentage now, with the more economical manner of working, it would pay the shareholders over 60,000*l.* a year on the present capital, and in putting the average at 35*l.* to the ton he thought he was putting the rate very low, because the average had been higher than that, and in the two next claims it was as high as 37*l.* and 310*l.* to the ton. As they approached the centre of the hill he believed they would have a much higher grade than they had at the surface, and with anything like reasonable luck they ought to return from 60 to 100 per cent. on the capital. (Hear, hear.) He had always advocated the development of the property, but he would not have done so if he had not been thoroughly satisfied of its value, and he thought it a great pity that his advice in the development of the mine should be taken so long after it was given, when the shareholders forbade the directors spending any more money on the property. If they had spent the 30,000*l.* or 40,000*l.* they then had in prospecting the South Aurora mine, he thought they would not now be asking for more capital. The board now asked for 30,000*l.*, which might look a rather large sum, but it should be borne in mind that it would be necessary to spend from 2000*l.* to 5000*l.* in putting the mill in good order for working, and the supplies of quicksilver, &c., would require some floating capital. The possession of working capital would give them many advantages. He did not think those who subscribed for the debentures would run any risk whatever, for there was no doubt that the property would sell for a great deal more than 30,000*l.* If the shares went up the debentureholders would have the opportunity of exchanging their debentures for shares at 30*s.* each, and if the shares did not go up in value they would always have the security of the property. He thought the shareholders would be very short-sighted if they did not take up the debentures—of which the directors and their friends would subscribe for one-half—and allow the property to be thoroughly developed. Capt. Drake referred to the bad gas he had lately met with in the workings, and he thought that a very good sign, for he remembered that in sinking a shaft in the Eberhardt Mine some years ago, at a point where no ore was sighted, the air was so bad that he had to have air pumped in from the workings to allow the men to go on, and within 10 yards of that spot ore averaging 3100*l.* to the ton was reached. It was a saving amongst the miners there that—"You can smell the ore." He had full confidence that they would be repaid many times for what they had spent on the property. (Hear, hear.)

On the motion of Mr. WILLIAMS, seconded by Mr. BIRCHALL, the directors, Messrs. Spratt, Applegarth, Berghell, and Towne, were re-elected, and the question of an additional director was left entirely to the board.

Mr. BERGHELL remarked that any news which could interest the shareholders was always sent to them on the day of its arrival.

On the motion of Mr. WILSON, seconded by Mr. BLACKSTONE, Mr. Louis M. Berghell was re-appointed as auditor for the current year.

The meeting was then constituted extraordinary.

The CHAIRMAN, in proposing "That in pursuance of Article 33 of the Articles of Association the company be and are hereby authorised to borrow on debentures, either transferable or to bearer, any sum or sums not exceeding 30,000*l.*," said these debentures would form a first charge on the assets of the company, and that would be stated on the face of the bonds.—Mr. BERGHELL seconded the proposition.

The CHAIRMAN, in reply to observations, said the debentures would be modelled on those of a company that had issued half a million of debentures. It was proposed to make 25 per cent. payable on application, and 25 per cent. at intervals of not less than one month's notice, and on amounts paid in advance they would allow a rebate of 6 per cent.; about 20,000*l.* would remain out of the 30,000*l.* for the actual development of the mine.

The proposition was carried unanimously.

It was decided that the bonds should bear on the face of them that the interest was cumulative, and that it was payable half-yearly out of profits. The following resolutions were also passed unanimously:—

"That such debentures shall bear interest at the rate of 10 per cent. per annum, payable out of profits. That the holders of such debentures shall be at liberty to exchange the same at any time for fully paid up shares of 1*l.* each at a premium of 10*s.* per share. That for the purpose of enabling the directors to carry out this exchange they are hereby authorised to increase the capital of the company by the creation from time to time, as may be required, of 20,000 shares of 1*l.* each, in accordance with the provisions contained in paragraphs 34 and 35 of the Articles of Association. That the said debentures be issued for five years, redeemable at par at any time at the option of the board upon giving three months' notice."

On the motion of Mr. DAVIS, seconded by Mr. WILLIAMS, a vote of thanks was passed to the Chairman and directors, and the meeting then terminated.

WEST CRAVEN MOOR LEAD COMPANY.

The fourth annual general meeting of shareholders was held on Monday, at the Imperial Buildings, Queen Victoria-street, Mr. R. H. SILVERSIDES in the chair.

The notice convening the meeting was read, and the minutes of the last meeting were read and confirmed. The general balance-sheet, with profit and loss account, were taken as read, and were then passed.

The CHAIRMAN stated that in consequence of the retirement of Mr. Hilton from the directorate, the office of director was open. Mr. Lawrence S. Burt was unanimously elected a director. The auditor—Mr. H. J. Green—having retired, offered himself for re-election, and he was unanimously elected on condition that he would accept the office at a fee of 5*l.* 5*s.* an audit. This concluded the ordinary business.

The SECRETARY then read the notice convening the extraordinary general meeting.

The CHAIRMAN said that as far as this meeting was concerned it was the old story of the rock ahead on which so many limited companies had come to grief. There had been something more than insufficiency of capital; it was attributable to the value of produce. The first parcel of lead sold for over 21*l.* per ton, and since then the price had been going down till it reached 12*l.* 10*s.* per ton for pig-lead. The position of the directors had been perplexing, and, although they had done the best they could for the shareholders, they believed they had done the best that was possible for the property. Their only satisfaction was that the lead, which would have been sold at a ruinous price, remained. They had not incurred debts, as many companies had done, and during the depression they could not ask you for money as they now do—with a great amount of confidence. The Articles gave them power to raise money, but they deemed it best to come to the shareholders, and they now ask your assistance to raise a sufficient sum on debentures, and his last visit to the mine he saw the property, and his confidence in it was still unabated, and he must earnestly put it before them that they, having cultivated the mine, must not let others come in and reap the benefit (which must assuredly come) of their outlay. As some of the shareholders may have forgotten the report of Mr. Hitchens, whose professional abilities may be equalled, but certainly not surpassed, and who he believed was a very cautious man, he thought it might be as well if he read an extract from it. That report was made in June, 1875, and the following was the extract which he proposed to read:—"Although the great account given me of this property led me to think that I should find it a valuable one, I did not expect to see lodes presenting evidence pointing so clearly to this realisation of great and early success, which the discoveries already made may indeed be said to ensure." There are several other reports besides that of Mr. Hitchens which were equally satisfactory, and he then put the managing director and secretary's report to them, and proposed that it should be received and adopted, and would be glad before doing so to answer any questions they might think proper to put.

It was then resolved that the managing director and secretary's report be taken as read. The SECRETARY then read the agent's report.

The CHAIRMAN said that in introducing the business he would not put any proposition until they had discussed and put any question to the managing director or agent respecting the merits or demerits of the mine and question before it.

A SHAREHOLDER: Will the sum you propose to raise be sufficient?—The SECRETARY: Yes, more than sufficient.

A SHAREHOLDER: Supposing the money is raised, how long will it be before you raise lead from the bottom level?—Capt. WILLIAMS: As soon as the water is out, which can be done in three or four days, the quantity raised from the eastern part of the mine will depend on the force employed. As we go down we have good ore in each of the levels, and it is a fact that in each of these mines the deeper we go the better the lead, and from one point alone we shall be able to return some 30 tons per month.

A SHAREHOLDER: How is it you have not returned more lead?—The MANAGING DIRECTOR: Owing to our funds having been so nearly exhausted, and the lead markets so very much depressed, we were obliged to restrict our operations, and confine ourselves to carrying out the covenants of the lease, so as not to lose the property. In this we were undoubtedly studying the interests of all concerned in this company.

A SHAREHOLDER: What advantage is there in increasing the number of the shares?—The CHAIRMAN: We shall come to that presently, and as time is valuable the resolution I propose is—"To raise 5000*l.* on debenture bonds of 5*l.* and 10*l.* each, bearing interest at the rate of 7*l.* per centum per annum, and that they be offered in the first instance to the shareholders in the West Craven Moor Lead Company (Limited), and that the said bonds be redeemable in three years, the company taking power to redeem before if expedient."

After some discussion it was resolved, and carried unanimously, that the bonds should be issued as above, carrying interest at 6 per cent. instead of 7 per cent.

THE CHAIRMAN: The next resolution I have to propose is that the shares be subdivided, and it rests with you whether they shall be for 24, 10s., 2s., or 1s. each. The SECRETARY explained that it was the wish of several shareholders that the shares be subdivided, there being few mines on the market with shares standing at 10s. each—par price—but in the event of their being subdivided as proposed it would simplify the sale of the shares in the event of a holder of a 10s. share wishing to dispose of part of its interest.

Ultimately the following resolution was unanimously carried:—"That the 3000 shares of 10s. each be subdivided into 30,000 shares of 1s. each."

The proceedings then terminated with a vote of thanks to the Chairman.

NANT RHYS SYNDICATE.

A meeting of shareholders was held at the company's offices, Queen Victoria-street, on Monday.—Mr. H. WRIGHT in the chair.

The SECRETARY having read the notice convening the meeting,

The CHAIRMAN said that as this was simply the statutory meeting, and as the company had only been working for six weeks they must not expect great results. Every mining operation must of necessity have a certain element of risk, but they had the advantage of a property through which some of the best known lodes of lead and copper passed, ample water-power, good roads, no costly sinking of shafts, no pumping necessary, no large staff, and a mining captain in whom they had confidence. Captain Michell had worked for years at the old Cwmystwith, the adjoining mine (which had been one of the richest mines in England), and, therefore, thoroughly knew his ground, and what his opinion was could be seen from the following report which had come up this morning:—

Capt. W. Michell reported that the south lode is about 200 fms. north of the southern boundary, and running through the sett for a mile in length into a mountain 120 fms. high. The lode was discovered and traced on the mountain side from 2 to 3 ft. wide, composed of clay-slate, flookan, spar, sulphur, with spots of lead ore—a masterly, promising lode. They have commenced a level on this lode, and by driving 20 fms. shall get 60 fms. of backs, with a gradual rise to 100 fms. or over, and to judge by present indications they can reasonably expect to cut a valuable bunch of ore at any time after driving 25 to 30 fms. The copper lode is 300 fms. north from the south lode, and at the points opened on shows several branches of beautiful spar intermixed with carbonates of lime, sulphur, with nice spots of copper and lead ore, all dropping towards the large flookan or soft ground similar to which the richest bunches of lead ore have been met with in the old adjoining mine. They have cleared a great deal of stuff from the brook, but not seen the rock. There are many other known lodes in the sett, and will be opened on in due course.

Mr. LETHBRIDGE said he had the utmost confidence in the undertaking, everything was favourable, and the careful way in which the directors had gone to work was worthy of all praise.

After a few remarks by Messrs. MILNE, WALTON (the company's engineer), CLARK, LETHBRIDGE, and others, the usual complimentary votes were passed, and the meeting separated.

WEST KITTY (Telegram).—The meeting of shareholders held at the mine, on Thursday, passed off most satisfactorily. The report of Capt. White, of Wheal Pevor, made a great impression. He reports that the lode in the 72 fm. level is worth 20l. per fathom, and the shares are in demand at 2l. Full details of the proceedings will be published in the *Mining Journal* next week.

FOREIGN MINING AND METALLURGY.

An incident which occurred at Brussels last week occasioned some little sensation in the Belgian iron trade. An agent of the Providence Company, without any previous consultation with his chiefs, issued a circular announcing a considerable reduction in prices. This circular has since been officially withdrawn and disavowed. Means of production are still being increased in Belgium, especially as regards steel. The Angleur Steelworks Company has just purchased the complete plant of the Witten Works belonging to the Essen group. The sum required for this purchase has been about 14,000l. By means of this acquisition of additional plant the Angleur Steelworks Company will be enabled to increase its production from 100 or 110 tons per day to 300 or 350 tons per day. The new appliances and arrangements are expected to be in complete going order in four months. A Belgian firm, MM. Rolin and Co., of Brauxell-le-Comte, have taken part in the establishment of some works at Sairghano, Italy, for the construction of railway plant. The works have already obtained a good order from the Upper Italy lines.

Business in coal has fallen off upon the Paris market. With the return of fine weather the requirements of domestic consumption are of course materially curtailed. On the other hand, the arrivals have become much easier and more regular, as well by water as by railway; and some reduction in prices has been the result—a reduction which appears likely to become more decided. The contraction in business reported in coal for domestic consumption has not made itself felt as regards coal required for industrial purposes; orders for these latter quantities continue to arrive regularly, while prices have been supported with firmness. In the basins of the Nord and the Pas-de-Calais the aspect of business in industrial coal is in harmony with the Paris market, and prices have even been tending upwards.

The coal trade has remained in much the same state in Belgium. There has been a little feebleness in quotations at Liège, and collieries which had reduced their quotations have not at present raised them again. With the close of the winter and the advent of spring the demand for domestic qualities of coal has, of course, materially declined. Coke has been quoted at Liège at 14.0s. 10d. to 14.4s. per ton. At Charleroi and Mons the market for coke has not yet been affected by the fall which has occurred in prices in the Liège basin. The increase in the production of pig will naturally involve a corresponding demand for coke. No change of importance has occurred of late in the Austrian coal trade. Silesian coal has slightly declined at Vienna, but the collieries of the district have maintained their rates. The re-opening of the Elbe is expected to give a stimulus to the lignites of Bohemia.

Business in iron has been pretty well sustained in the department of the Haute-Marne. Irrespective of contracts of some extent, the orders which arrive absorb from one-fourth to one-third of the production, and, upon the whole, business must be said to be active. Mixed rolled iron has been disposed of at 10l. 12s. to 11l. per ton. No. 20 mixed machine iron is worth 10l. 16s. to 11l. per ton. There has not been much business in pig, in consequence of the scantiness of stocks. Casting pig No. 3 has been dealt in at 4l. 16s. to 5l. per ton. Worked pig has been in considerable demand, and prices have exhibited an upward tendency. The iron markets of the east and centre of France have shown firmness. The Nucheville-Villerupt Blast-Furnaces Company proposes to establish steelworks.

COLORADO UNITED.—An interesting account of the property of this company is published in the Georgetown Courier of Feb. 26, in which it is stated that the several properties owned by this company are steadily improving, as the opening up of new reserves progresses. Four new levels—the 10th and 11th—have been started from the Silver Ore shaft, two of them going in an easterly and two in a western direction. The ore in sight have gradually increased since January, 1879, and the reserved stopping ground is now sufficient to last the present year. When the 10th and 11th levels are driven the Terrible Silver Ore Mine will have at least two years stopping ground ahead. Mr. Hamill then intends to resume sinking the Silver Ore shaft; this will be by April 1, and by the close of the year the Silver Ore shaft will be deep enough for the 12th and 13th levels.

The United States Coin Lode, one of the many lodes owned by the company, is about 700 ft. north of the Terrible. During last summer Mr. Hamill leased a portion of the Coin lode to Wm. Brooke and Co. (now transferred to Mr. Rockwell), who commenced driving the Fitzpatrick level. After running in ore that yielded but 70 to 90 ozs. a winze was sunk from the floor of the level, and the ore improved rapidly both in quantity and quality, the last mill-run, of nearly 4 tons, giving 241 ozs. per ton. The ore vein at present bottom of the winze is from 7 to 8 in. in width, with from 5 to 10 in. of quartz, with seams of ore through it. Next westerly from Mr. Rockwell's ground a lease has been granted to Messrs. Campbell, Stewart, and King, who are engaged in running a cross-cut northerly from the first level in the Brown Mine, to strike the north vein of the Coin. At the end of Campbell's and Co.'s ground Job and Co., who are now leasing from Job's Isaac Tregay and Co. are working in a winze sunk from the first level on the Coin. At the bottom of the Tregay winze, in the Coin, there is from 6 in. to 8 in. of ore, of a very good grade. The workings on the Coin have practically lain idle since 1879. Mr. Hamill is of opinion that the present developments inaugurated in the U. S. Coin will open up a body of ore surpassing anything yet found on Brown Mountain, and that in ten years' time the Old U. S. will be among the heaviest producers in the State.

HOLLOWAY'S PILLS—PURE BLOOD.—When the blood is pure, its circulation perfect, and the nerves in good order, we are well. These pills possess a marvellous power in securing these great secrets of health by purifying, regulating, and strengthening fluids and solids. Holloway's pills can be confidently recommended to all persons suffering from disordered digestions, or worried by nervous fancies or neuralgic pains. They correct acidity and heartburn, dispel sick headache, quicken the action of the liver, and act as alteratives and gentle aperients. The weak and delicate may take them without fear. Holloway's pills are eminently serviceable to invalids of irritable constitution, as they raise the action of every organ to its natural standard, and universally exercise a calming and sedative influence.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

MANCHESTER CITY MEWS, HORSE, AND CARRIAGE REPOSITORY COMPANY (Limited).—Capital 30,000l., in shares of 5l. To purchase, conduct, and carry on a business of this kind in Manchester. The subscribers (who take one share each) are—W. Brierley, Prestwich; D. King, Leigh; T. T. Holt, Chowbent; J. T. Jeeres, Manchester; J. N. Haslam, Manchester; J. Hill, Manchester; J. J. Smith, Heywood; R. Wright, Salford.

THE GILBERTHWAITE IRON COMPANY (Limited).—Capital 10,000l., in shares of 5l. The purchasing or otherwise acquiring of the Gilberthwaite Iron Mine, situate in the parish of Emmerdale, Cumberland. The searching for, selling, and disposing of iron ore and any other minerals. The purchasing and providing all necessary machinery, plant, and other requisites and appliances for the purposes of the company. The subscribers (who take one share each) are—W. H. Scott, 54, Windsor-road, accountant; T. H. Fletcher, Clapham, agent; N. H. Cork, 45, Mayton-street, stationer; G. Griffiths, Brixton, no occupation; A. W. Mavley, Exeter Hall, C.E.; W. Wilkinson, 7, Tolgarth-road, engineer. No Articles of Association are registered.

THE HAVANA IMPORT COMPANY (Limited).—Capital 50,000l., in shares of 50l. The import and export of cigars and tobaccos. The subscribers are—H. Brustlein, Loire, 150; J. E. Brustlein, New York, 150; A. Brustlein, Basle, 300; E. Gutheitz, New York, 1; O. Gutheitz, New York, 1; E. Marx, Antwerp, 138; L. Marx, 106, Fenchurch-street, 260.

THE GUARDIAN AND GENERAL INSURANCE COMPANY (Limited). Capital 50,000l., in shares of 1l. For effecting all kinds of insurances. The subscribers (who take one share each) are—R. Attenborough, Reading; Lord Keane, 30, Hill-street; G. E. Price, 39, Onslow-square; F. Wright, Alfreton; E. H. Wilson, 16, Millman-street; A. T. Smith, 24, Marmion-road; H. Sinnett, 31, Lombard-street.

AMERICAN EXCHANGE IN EUROPE (Limited).—Capital 200,000l., in shares of 2l. To purchase, take over, and carry on the exchange business established at 449, Strand, and 3, Adelaide-street. The subscribers (who take 10 shares each) are—H. Gillig, 449, Strand; W. T. Gidner, Boston; A. D. Smith, Boston; H. S. Hyde, Springfield; F. H. Story, Boston; G. W. Warren, Boston; L. de Lawson, New York; J. Appleton, Boston; H. Morris, New York; O. Gillig, Brooklyn.

THE WALSALL GLUE COMPANY (Limited).—Capital 10,000l., in shares of 10l. The manufacture and sale of glue, size, and manure, &c. The subscribers (who take one share each) are—W. J. Turney, Stourbridge; J. Turney, Nottingham; L. W. Lewis, Walsall; J. W. Lewis, Nottingham; C. W. Williamson, Walsall; G. Elliott, Walsall; W. W. Lewis, Nottingham.

THE BRISTOL STEAMSHIP COMPANY (Limited).—Capital 60,000l., in shares of 50l. To carry on the trade of a shipowner in all its branches. The subscribers are—E. Beales, Cardiff, 2; E. R. Carlyon, Diden, 2; W. G. Chutts, Cardiff, 1; J. O. Thomas, Cardiff, 1; J. Lewis, Cardiff, 1; C. A. G. Pullin, Cardiff, 1; H. Wood, Cardiff.

THE MERCHANTS' COFFEE PALACE COMPANY (Limited).—Capital 10,000l., in shares of 2l. The purchasing and selling of refreshments of every description, intoxicants excepted. The subscribers are—T. L. Laverick, Heaton Mersey, 50; J. Hoxley, Liverpool, 5; W. Hopley, Fairfield, 5; J. H. Wharton, Liverpool, 5; R. W. Wharton, Liverpool, 5; C. Baxendell, Liverpool, 5; W. M. Harper, Aintree, 1; W. H. Quilliam, Liverpool, 1.

THE PALACE HOTEL AND HYDROPATHIC SPA COMPANY (Limited).—Capital 70,000l., in shares of 5l. To carry on the business connected with a hydropathic establishment. The subscribers are—W. Sharp, Manchester, 200; G. Chamberlain, Southport, 200; H. Anscough, Parbold, 200; C. Holt, Manchester, 50; H. Turner, Offer-ton, 50; J. Lightfoot, Southport, 50; H. Blumberg, Southport, 200.

THE LONDON AND WESTMINSTER BANK is incorporated under the Limited Liability Act.

THE LEAMINGTON PRIORS AND WARWICKSHIRE BANKING COMPANY is incorporated under the Limited Liability Act.

THE IMPROVED MILK AND FOOD COMPANY (Limited).—Capital 25,000l., in shares of 5l. The manufacture and sale of food preparations. The subscribers are—W. Hird, Chelsea, 10; E. H. Blakeney, Thornton Heath, 10; L. W. Fisher, Campden Grove, 10; W. H. Bowers, Hertford, 10; M. Bevan, 23, Milk-street, 3; C. Griffin, 27, Leadenhall-street, 10; G. H. M. Thompson, 21, Abingdon-villas, 10.

THE GLYNCORRWG COLLIERY COMPANY (Limited).—Capital 78,000l., in shares of 10l. To adopt and carry out an agreement made with the Glyncorrgw Colliery Company (Limited), and taking over its undertaking and business, all its mines, assets, and effects. The purchasing or otherwise acquiring any other mining properties in South Wales, to work such mines, and convert or manufacture the minerals, and to sell the same. Power is taken to hold shares in, and advance money to, the South Wales Mineral Railway Company, and to lease or work such railway. The subscribers (who take one share each) are—J. W. Newton, 5, Fumival's Inn, C.E.; A. J. Ityle, 1, Westminster Chambers, architect; P. F. Rose, 6, Victoria-street, solicitor; J. S. Parkin, 11, New-square, barrister; Samuel Laing, 5, Cambridge Gate, M.P.; F. V. Dickens, Middle Temple, barrister; H. T. Norton, 32, Cornwall Gardens, solicitor. There are no Articles of Association registered.

METROPOLITAN MANSIONS COMPANY (Limited).—Capital 100,000l., in shares of 20l. To carry on generally the business of an estate and building company. The subscribers (who take one share each) are—E. W. Godwin, 8, Victoria Chambers; G. G. Campbell, 2, Bryanston-square; W. Webb, 11, Austinfriars; W. W. Williams, 29, Highbury Quadrant; J. Surr, 12, King-street; H. E. Omerod, King's Bench-walk; H. E. McLeod, 8, Jeffrey's-square.

THE SOUTH CARNARVONSHIRE GRANITE COMPANY (Limited).—Capital 10,000l., in shares of 5l. To carry on quarrying operations in Carnarvonshire or elsewhere. The subscribers (who take one share each) are—H. Thompson, Stratford; W. R. Johnson, 37, Walbrook; T. Coad, North Brixton; E. Pollock, 5, Bond-court; W. W. Folkard, 1, Milton Buildings; A. S. Morton, 12, Buckingham-street; H. C. Schellinger, Brixton.

THE COURT GRANGE UNITED SILVER-LEAD MINING COMPANY (Limited).—Capital 30,000l., in shares of 1l. To adopt and carry into effect an agreement made between J. Pell and W. L. Dunn on behalf of the company relative to the purchase of certain mines and premises situate in Cardiganshire, with the machinery, plant, and effects. To work, raise, purchase, dress, and prepare for the market any ores, metals, or minerals, and to sell, traffic, and deal in the same, with power to demise or dispose of the mines and premises, and to acquire and work any other properties. The subscribers (who take one share each) are—J. M. Burton, 4, Newgate-street, valuer; A. Wilson, 41, Mincing-lane, broker; C. O. Rogers, Winchester House, merchant; S. A. Cobbett, 1, Winchester House, accountant; S. Ben-stall, Oriental Club, esquire; W. L. Dunn, Clapton, accountant; G. Green, Aberystwyth, engineer. The subscribers will form the first board. Remuneration 300l. per annum, and 5 per cent. on dividends to be divided.

THE GOLD COMPANY OF SOUTHERN INDIA (Limited).—Capital 100,000l., in shares of 1l. To purchase or otherwise acquire mines and mineral properties, lands, or hereditaments in India or elsewhere, and to hire, construct, and lay down all necessary machinery, plant, tools, buildings, tramways, rolling stock, wharves, &c. To work, develop, and maintain the mines and mineral properties of the company, and to manufacture, smelt, reduce, and dress the ores, minerals, and other produce. The subscribers (who take one share each) are—H. Temple, 15, Florence-road, gas inspector; R. Merick, 5, Finsbury-circus, accountant; D. Bryce, Guildhall Chambers, merchant; E. Glover, Romford, manufacturer; G. Blagden, 7, Fenchurch-avenue, solicitor; W. H. Murdock, 34, East Cheap, commission merchant; J. S. Houston, Crosby Hall Chambers, shareholder. Qualification for a directorship, 200 shares. Remuneration, 100l. per annum.

SOMOROSTRO IRON ORE COMPANY (Limited).—Capital 75,000l., in shares of 5l. The acquisition by purchase or otherwise of several mines or mineral properties, with their appurtenances, wire tramways, the estate, and effects of the Somorostro Iron Ore Company (Limited), now in liquidation. The working, raising, winning, wash-

ing, and getting of ores, metals, minerals, and mineral deposits, and otherwise developing the lands, mines, and mineral properties acquired by the company. The manufacture, smelting, and reducing of ores, and the purchase and sale of iron and other metals, ores, &c. The subscribers (who take one share each) are—M. Curtis, Manchester, machinist; J. Rice, Manchester, banker; W. Richardson, Oldham, machinist; H. Bartlett, Great Yarmouth, no occupation; W. Davis, Bridgend, colliery proprietor; J. Higson, Manchester, C.E.; R. Curtis, Manchester, machinist; 1000l. per annum to be divided amongst the directors, their qualification being fixed at 50 shares.

THE GREAT NORTHERN STEAMSHIP FISHING COMPANY (Limited).—Capital 25,000l., in shares of 200l. To build and use ships and vessels for the conveyance of fish, &c. The subscribers are—C. Hillyer, Hull, 10; H. A. Cousins, Hull, 7; W. J. Roburs, Hull, 6; J. Wood, Hull, 4; J. Dugdale, Hull, 5; P. Pates, Hull, 5; E. Williams, Hull, 4.

THE HULL STEAM FISHING AND ICE COMPANY (Limited).—Capital 30,000l., in shares of 25l. For the conveyance of fish, ice, &c. The subscribers are—W. Carr, Hull, 5; A. W. Ansell, Hull, 20; C. Pickering, Hull, 20; H. Toozes, Hull, 4; J. Sims, Hull, 20; R. Loram, Hull, 20; H. Burton, Hull, 16.

THE WASTE METALS PRODUCTS COMPANY (Limited).—Capital 5000l., in shares of 5l. To acquire and work certain patents. The subscribers are—E. W. Williams, 1, Mincing-lane, 10; T. Brown, 11, Queen Victoria-street, 10; A. Gutensohn, 11, Queen Victoria-street, 10; T. Hopcroft, 1, Mincing-lane, advertisement agent, 10; F. Christie, Stoke Newington, 1; B. Mainwaring, 30, Grosvenor-place, 40; C. J. Lee, Poultry Chambers, 20.

M'CORQUODALE AND COMPANY (Limited).—Capital 200,000l., in shares of 100l. To continue the business of stationers, printers, engravers, &c. The subscribers (who take one share each) are—G. M'Corquodale, Newton-le-Willows; C. E. Hamilton, 17, Change-alley; G. F. M'Corquodale, 17, Change-alley; A. C. M'Corquodale, Newton-le-Willows; G. Hilton, Newton-le-Willows; D. Davidson, Newton-le-Willows; J. L. Wood, Newton-le-Willows; D. Culross, 85, Caversham-road; T. Wighton, Croydon.

THE CITY BANK increases its capital to 4,000,000l. upon its incorporation under the Limited Liability Acts.

NEW GOLD RUN COMPANY (Limited).—Capital 60,000l., in shares of 1l. To purchase, or otherwise acquire, the shares, debts, and assets of the Gold Run Hydraulic Mining Company (Limited), together with the lands, hereditaments, veins, lodes, mines, and property known as Cedar and Sherman Claims, situate in Placer County, State of California, and any other properties, for the purpose of carrying on all mining and washing operations in all their branches. The subscribers (who take one share each) are—W. Summis, 14, Milkwood-road, accountant; S. Schneider, Chelsea, engineer; J. Milne, 34, Gracechurch-street, merchant; W. D. Lethbridge, 18, Marlborough-road, no occupation; F. Moulter, Bow, clerk; F. M'Mahon, Upper Holloway, accountant; G. E. Bone, Walworth, clerk. The subscribers to appoint the directors, the number of whom shall not be less than three or more than six. Qualification 250 shares.

STEAMSHIP ESCAMBIA COMPANY (Limited).—Capital 32,500l., in shares of 50l. The purchasing and working of the Escambia and other vessels. The subscribers (who take one share each) are—G. B. Crowe, Liverpool; J. H. Bogart, Liverpool; W. N. Rudolf, Liverpool; A. Scott, Barkley; R. Burn, Liverpool; J. D. Adams, Liverpool; J. Smith, Liverpool.

HEMSWORTH COLLIERY COMPANY (Limited).—Capital 10,000l., in shares of 50l. To carry on the business of colliery proprietors, coal merchants, coke manufacturers, and brickmakers in all branches. To purchase or otherwise acquire the Hemsworth Colliery, in Yorkshire, and to work and sell the coal, clay, and minerals, with power to acquire all buildings, plant, machinery, implements, appliances, and effects now erected on the lands and mines at Hemsworth. The subscribers (who take one share each) are—A. Stopford, Manchester, brewer; D. T. Flattely, Longsight, brewer; F. W. Scott, Liverpool, wire-rope maker; L. Bawforth, West Gorton, cashier; W. C. Flattely, Longsight, brewer; J. G. Dowse, Liverpool, surgeon; W. Glossop, Hull, malster. The subscribers to appoint the directors, whose remuneration will be by fee of one guinea for each meeting. The qualification is fixed at 500l. either in shares or stock of the company.

PETROLEUM IN GERMANY—THE FLOWING WELLS IN HANOVER.

Reference was made in the *Mining Journal* a few weeks since to the attention which is now being directed to the petroleum discoveries in Hanover, and as the matter is now taking a commercial form the subjoined additional information will be of general interest. The Hanoverian petroleum region has been ascertained to extend from the City of Hanover, where oil is found in the suburbs of Linden and Linmer, as far as the Hildesheim Hills to the south, and the villages of Oilper and Klein Schuppenstett to the east. The whole area seems to comprise about 40 square miles, the centres being at Oberg and Oilsburgh, and the districts due north and south of these two principal places. Mr. Strippelman, a well-known mining engineer, and the latest author upon the subject, in a recent elaborate account, gives it as his deliberate opinion that things in Hanover have reached a point exactly similar to what was the situation in America immediately anterior to the discovery of the Pennsylvania wells. A like view is taken in a report by Mr. von Dücker, a Hanoverian mining Councillor and Government engineer, who has just inspected the Odessen Works.

Steps are being taken for forming a Petroleum Boring Company to work the newly discovered riches of Hanover. The present bores yielding an average interest of 22 per cent. upon the capital invested, against 19 per cent. realised in America, the prospects in Germany are regarded as sufficiently promising to justify the simultaneous opening of several bores in different localities. The Pennsylvania bore-boring apparatus recently employed is capable of piercing from 30 to 40 ft. per day, whereas with the old machinery hitherto in use no more than 2 or 3 ft. could be perforated. The annual yield of the Hanover wells at the present rate is estimated at 10,000 cwt. per annum.

These fresh discoveries of petroleum may have an important bearing upon the deposit of asphaltum which is found in the vicinity of Bentheim a few miles west. Mr. von Dücker in a recent letter—Feb. 24—states this mineral is found in considerable abundance in the fissures of the sandstone formation of the Bentheim district "is nothing else than solidified petroleum, and a product of the distillation of liquid bitumen at great depth." It is believed and boldly asserted by many of the most distinguished geologists in Germany that there must be, from certain surface indications, an immense basin of petroleum in the vicinity, the vapours from which found their way into the fissures of the sandstone about Bentheim, and rising to a point about 20 ft. from the surface were there finally condensed. In sinking shafts or boring the solidified petroleum is instantly discovered; at first only a few inches thick, and in depth sometimes increasing to 2 and 3 ft., according to the width of the crevices in the rock.

Besides the petroleum companies already organised in North Germany, at Hamburg, Bremen, Hanover, &c., for boring, others are forming. There is also one London company registered, and another will be very soon, for working these deposits of solidified petroleum near Bentheim, belonging to Mr. Thos. D. Sargent, of South Kensington, and as there are about 3000 acres, there will be plenty of scope for a large number of petroleum wells and numerous companies. Important results are looked for this summer from some of the borings, for which preparations are being made.

There have been already 400 tons of the solidified petroleum raised from Mr. Sargent's mines and distilled upon the spot, producing about 110 gallons of oil to the ton. Should liquid petroleum be found in abundance, as in America, it will be of immense importance to the commerce of Germany, and as there is now 30 per cent. duty on the imports of petroleum it will give a great impetus to this industry, by which the province of Hanover may become another Pennsylvanian oil region.

PRACTICAL MINING—IMPROVED ORE DRESSING
MACHINERY.

peculiar qualities he may have to provide for. The book will be very useful to a large number of readers.



PARIS EXHIBITION, 1878.

GOLD AND SILVER MEDALS AWARDED for
Steam-Engines & Boilers, also the Special Steam Pump,
and Compound Pumping Engine.

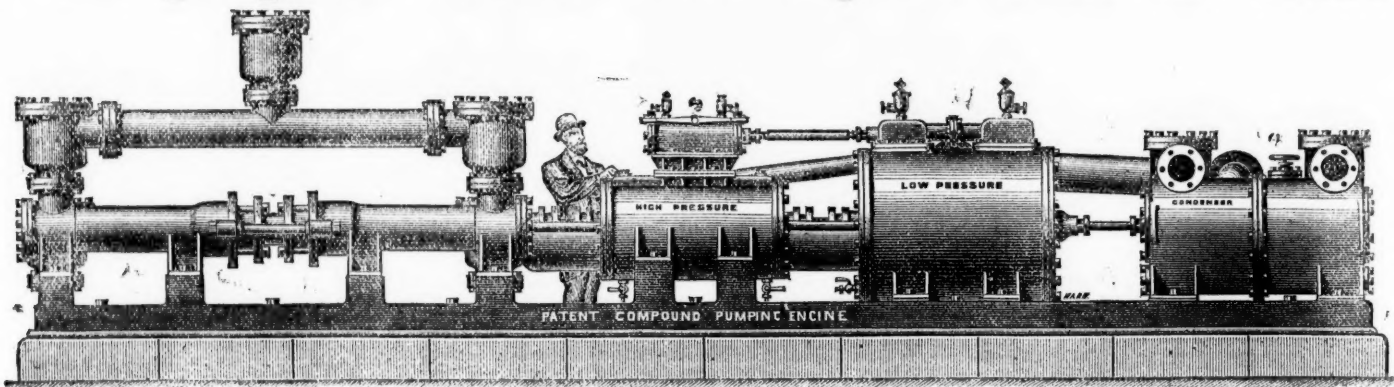


TANGYE BROTHERS AND HOLMAN,

CORNWALL HOUSE, 35, QUEEN VICTORIA STREET, LONDON, E.C.,
AND BIRMINGHAM, (TANGYE BROTHERS), CORNWALL WORKS, SOHO.

TANGYE'S DIRECT-ACTING
COMPOUND PUMPING ENGINE,

For use in Mines, Water Works, Sewage Works,
And all purposes where Economy of Fuel is essential.



TANGYE'S DIRECT-ACTING COMPOUND PUMPING ENGINE, WITH AIR-PUMP CONDENSER.

TANGYE'S COMPOUND PUMPING ENGINE COMBINES SIMPLICITY, CERTAINTY OF ACTION, GREAT ECONOMY
IN WORKING, COMPACTNESS, AND MODERATE FIRST COST.

This Engine will be found the most simple and economical appliance for Mine Draining, Town Water Supply, and General Purposes of Pumping ever introduced, and as regards Mine Draining, the first cost is very moderate compared with the method of raising water from great depths by a series of 40 or 50 fm. lifts. No costly engine-houses or massive foundations, no repetition of plunger lifts, ponderous connecting rods, or complication of pitwork, are required, while they allow a clear shaft for hauling purposes. In this Engine the economical advantages resulting from the expansion and condensation of steam are very simply and effectively obtained. The steam after leaving the high-pressure cylinder is received into and expanded in the low-pressure cylinder, and is thus used twice over before being exhausted into the condenser or atmosphere.

The following first-class Testimonials will bear evidence as to the efficiency and economy of the Engine:—

TESTIMONIALS OF TANGYE'S COMPOUND PUMPING ENGINE.

21" Newcastle and Gateshead Water Company, Newcastle-on-Tyne, Oct. 20, 1879.
36" x 10" x 48" COMPOUND CONDENSING STEAM PUMPING ENGINE.

Messrs. Tangye Brothers.

GENTLEMEN,—In reply to your enquiry as to the efficiency of the two pairs of Compound Condensing Engines recently erected by you for this company at our Gateshead Pumping Station, I have great pleasure in informing you that they have far surpassed my expectations, being capable of pumping 50 per cent. more water than the quantity contracted for; and by a series of experiments I find they work as economically as any other engine of the compound type, and will compare favourably with any other class of pumping engine. By the simplicity of their arrangement and superior workmanship they require very little attendance and repairs, and the pumps are quite noiseless. A short time ago I had them tried upon air by suddenly shutting off the column, and found they did not run away, thus showing the perfect controlling or governing power of the Floyd's Improved Steam-moved Reversing Valve. I will thank you to forward the other two pairs you have in hand for our Benwell Pumping Station.

(Signed)

Yours respectfully,
JOHN R. FORSTER, Engineer.

The Chesterfield and Boythorpe Colliery Company (Limited),
Registered Office, Boythorpe, near Chesterfield, Oct. 1, 1879.

21" 36" x 12" x 48" DOUBLE RAM COMPOUND CONDENSING STEAM PUMPING ENGINES.

Messrs. Tangye Brothers.

Supplied in January, 1878.

GENTLEMEN,—Referring to the above, which we have now had working continuously night and day for the last 12 months, we are glad to say that it is giving us every satisfaction. It is fixed about 400 feet below the surface, the steam being taken down to it at pressure of 45 lbs. per square inch. We can work the pump without any difficulty at 28 strokes per minute—224 ft. piston speed. The pumping power is enormous. The vacuum in the condenser being from 11½ to 13 lbs. The pump is easily started, and works well and regularly. The amount of steam taken being much less than we anticipated. We consider the economy in working very satisfactory indeed. The desire for power and economy at the present day will certainly bring this pump into great requisition.

Yours truly,
(Signed)

M. STRAW, Manager.

SIZES AND PARTICULARS.

Diameter of High-pressure Cylinder.....In.	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14
Ditto of Low-pressure Cylinder	14	14	14	18	18	18	18	21	21	21	21	24	24	24	24
Ditto of Water Cylinder	4	5	6	5	6	7	8	6	7	8	10	7	8	10	12
Length of stroke	24	24	24	24	24	24	24	24	24	24	24	36	36	36	36
Gallons per hour approximate	3000	6100	8800	6100	8800	12,000	15,650	8,800	12,000	15,650	24,450	12,000	15,650	24,450	35,225
Height in feet water can be raised with 40 lbs. pressure per square inch in } Non-condensing...	360	330	160	360	250	184	140	360	264	202	130	360	275	175	122
Ditto ditto ditto—with Holman's Condenser...	480	307	213	480	333	245	187	480	352	269	173	480	367	234	162
Ditto ditto ditto—with Air-pump Condenser...	600	384	267	600	417	306	335	600	440	337	216	600	459	203	203

CONTINUED.

Diameter of High-pressure Cylinder	16	16	16	16	18	18	18	18	21	21	21	24	24	24	30	30
Ditto of Low-pressure Cylinder	28	28	28	28	32	32	32	32	36	36	36	42	42	42	52	52
Ditto of Water Cylinder	8	10	12	14	8	10	12	14	10	12	14	10	12	14	12	14
Length of stroke	36	36	36	36	48	48	48	48	48	48	48	48	48	48	48	48
Gallons per hour approximate	15,650	24,450	35,225	47,950	13,650	24,450	35,225	47,950	24,450	35,225	47,950	24,450	35,225	47,950	35,225	47,950
Height in feet water can be raised with 40 lbs. pressure per square inch in } Non-condensing...	560	230	160	118	456	292	202	149	397	276	202	518	360	264	562	562
Ditto ditto ditto—with Holman's Condenser...	480	307	213	154	603	389	269	198	528	363	269	691	480	352	750	750
Ditto ditto ditto—with Air-pump Condenser...	600	384	267	191	750	486	337	248	660	450	337	864	600	440	937	937

PRICES GIVEN ON RECEIPT OF REQUIREMENTS.

Any number of these Engines can be placed side by side, to work in conjunction or separately as desired, thereby multiplying the work of one Pump to any extent.

NORTHERN DEPOT:—TANGYE BROTHERS, ST. NICHOLAS BUILDINGS, NEWCASTLE-ON-TYNE.

TWO GOLD MEDALS.

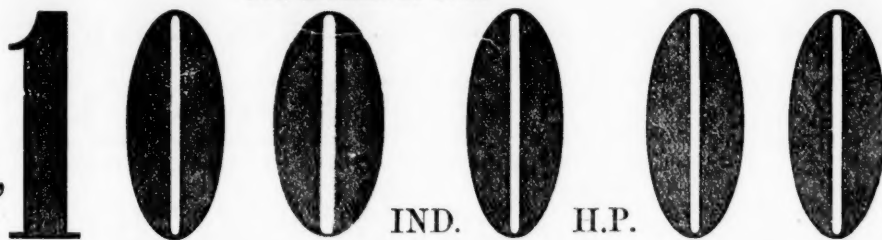


SOLE MAKERS—

The LEEDS FORGE CO., Ltd.,
Leeds, Yorkshire.

FOX'S PATENT CORRUGATED FURNACE FLUES,

NOW APPLIED TO OVER



PARIS, 1878.



PRICE LISTS AND
PARTICULARS
ON APPLICATION.

Electric-Bell Signals for Collieries, Factories, Warehouses, &c.,

WITH OR WITHOUT GALVANIC BATTERIES.

NEW SYSTEM—CAN BE RUNG AT ANY PART OF THE ROAD. Cheap, safe, and reliable. Efficiency guaranteed. LINES OF TELEGRAPH erected and maintained. LIGHTNING CONDUCTORS, &c.
For estimates and particulars apply to—

SYDNEY F. WALKER,
LATE G. E. SMITH,
TELEGRAPH ENGINEER.
COMMERCIAL BUILDINGS, LONG ROW, NOTTINGHAM.

INCREASED VALUE OF WATER-POWER.

MacADAM'S VARIABLE TURBINE.

This Wheel (which is now largely in use in England, Scotland, and Ireland) is the only one yet invented which gives proportionate power from both large and small quantities of water. It can be made for using a large winter supply, and yet work with equal efficiency through all variations of quantity down to a fifth, or even less if required. It is easily coupled to a steam-engine, and in this way always assists it by whatever amount of power the water is capable of giving, and therefore saves so much fuel.
This Turbine is applicable to all heights of fall. It works immersed in the tail-water, so that no part of the fall is lost, and the motion of the Wheel is not affected by floods or back-water.
References to places where it is at work will be given on application to—

MacADAM BROTHERS AND CO., BELFAST.

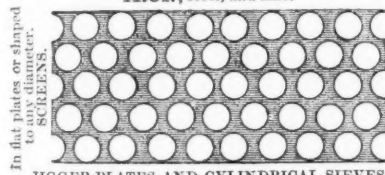
Export
Orders
promptly
attended to.

PERFORATORS, WIRE WEAVERS, AND GENERAL IRONMONGERS,

J. AND F. POOL,

COPPERHOUSE, HAYLE, CORNWALL.

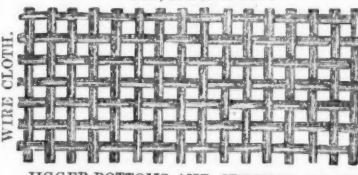
Millimeter holes perforated in sheet-copper, brass,
IRON, steel, and zinc.



CERTIFICATE OF MERIT

Awarded by the
Mining Institute of Cornwall
for
SIEVES AND GRATES,
Shown at the Annual Exhibition,
1879.

Lineal holes per inch woven in copper, brass,
iron, and steel wire.



Manufacturers of Stamps-Grates, Sieves, and Riddles, for Mining and other purposes, by Self-acting Steam Machinery.

SPECIALITY.—Thick Copper, Brass, Zinc, and IRON Perforations, Classifying-Sieves, Pierced Pulveriser and Stamps-Grates up to 289 holes to the square inch, Copper-bottom "Tinsifts" and Hair-bottom "Delewerling-serges."

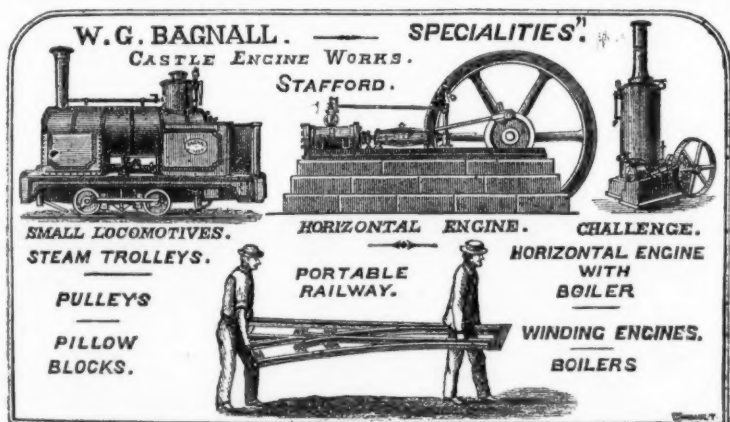
MINING AND COLLIERY TOOLS.

Picks, Shovels, Rakes, Riddles, Skips, Blowing Tools, Pit Tubs, Crucible Cast Steel Wheels and Axles, Tram Nails, Bolts and Nuts, Washers, Wagon Wheels and Axles, Springs, Chains and Traces, Harness, Files, Lifting Jacks, Crabs, Cranes, Pulley Blocks, Pit and other Rails, Screen Bars, Air Pipes, Brattice Cloth, Gas Steam and Water Pipes, Loco Tubes, Smiths' Hearths complete, Smiths' Tools, Powder Magazines and Safes, Wire and Hemp Ropes, Pit Tub and Wagon Ironwork of every description.

A LARGE STOCK ALWAYS ON HAND.

F. H. WARDEN (LATE THOS. WARDEN & SON),
BROMFORD IRON & STEEL WORKS, LIONEL ST., BIRMINGHAM.

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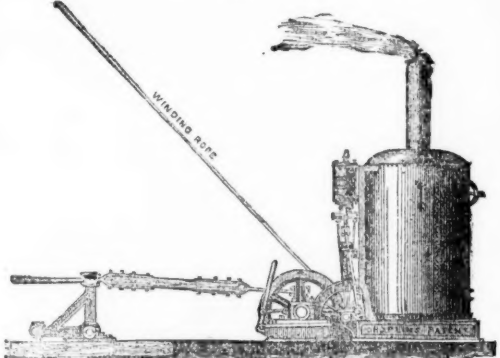


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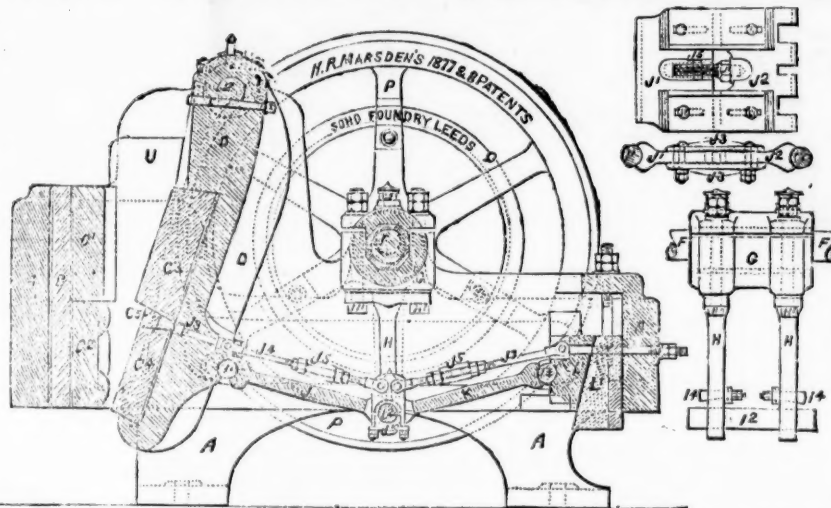
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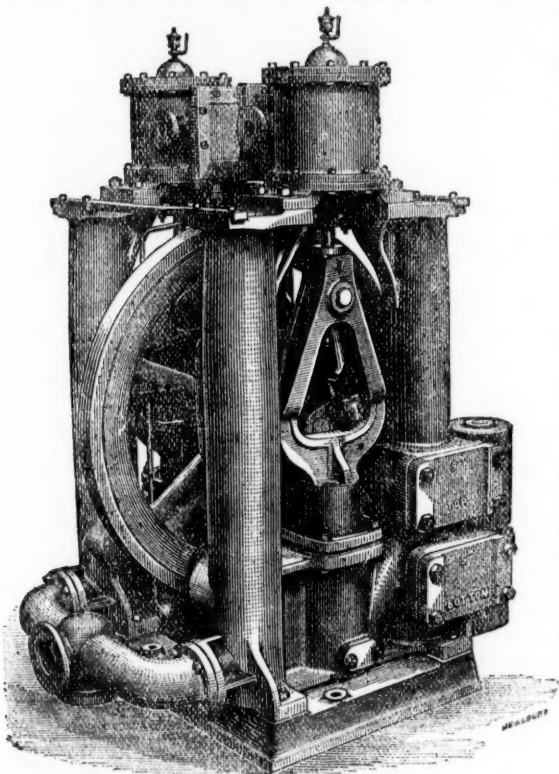
BLAKE'S STONE BREAKER.—Statement made by the Man-
aging Director of the St. John del Rey Mining Company,
Mr. John Hockin, with regard to six months' practical
working of Blake's Stone Breaker, affording facility for
judging of the relative economy of machine and hand
labour in this kind of work, and also of the cost of getting
the Stone Breaker to work in difficult places. The price
paid to Mr. Marsden for the machine referred to by Mr.
Hockin was £180, and adding to this the cost of engine,
carriage, and fixing, the aggregate cost to the company
of the Breaker in working order was £500. By this outlay
the company is enabled to dispense with the labour of 55
people, the value of which is £500 per annum. The cost
of working the machine could not be more than the wages
of about five men (the machine requires but one man to
feed it, so that the rest would be for engineer, fuel, oil,
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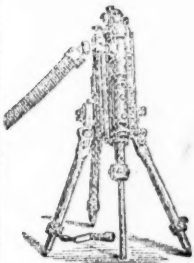
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